VOLUME XLVI NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

SEPTEMBER, 1924

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PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

$3.50 A YEAR 50¢ THE COPY

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TO carry out the purposes for which it was founded thirty-six years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

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Men who travel

know accuracy

SHORTLY before 3 o'clock every day the 20th Century Limited and the Broadway Limited leave New York for Chicago. After traveling nearly 1,000 miles over widely separate and different territories, they pull into Englewood together. The miles are measured accurately by the watches of the engineers.

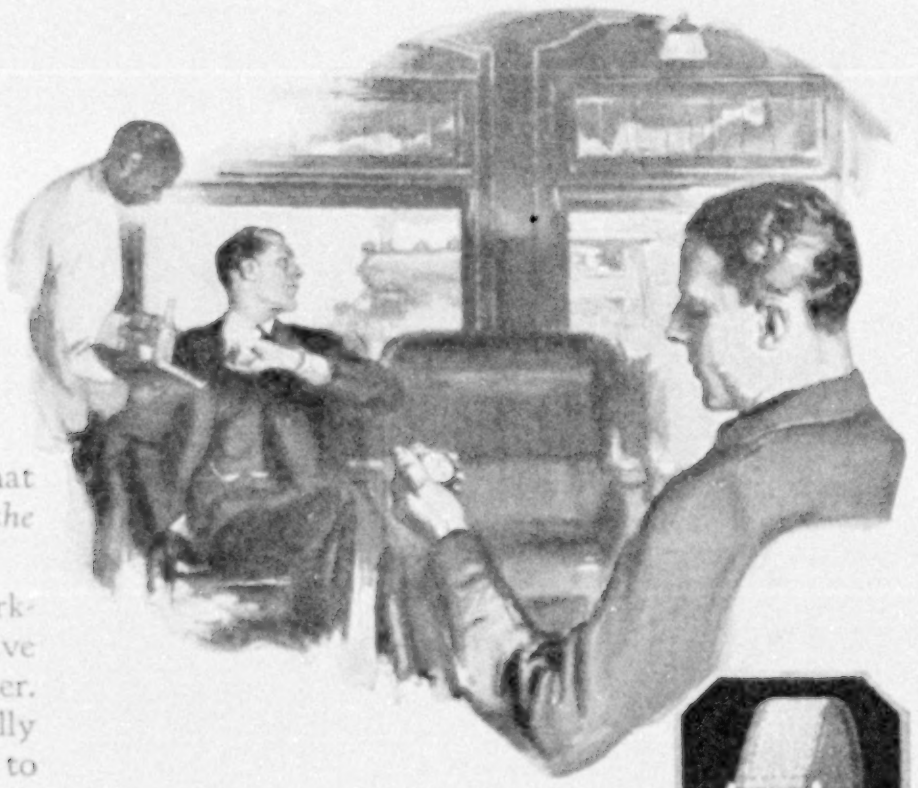
That's the sort of timekeeping that gave the Hamilton its reputation as *the* Watch of Railroad Accuracy.

Hamilton materials, Hamilton workmanship, and Hamilton sincerity have produced an extraordinary timekeeper. Because of its ability to serve faithfully over a long range of years, it proves to be the most economical accurate watch you can buy.

And when you see the beauty of the Hamilton, either the strap or the pocket models, you know you are looking at perfection in watch designing—the best there is.

This beauty many consider perfection in watch designing. It is a conservative beauty that will be consistently fashionable after years of service. You choose from a variety of cases and dials.

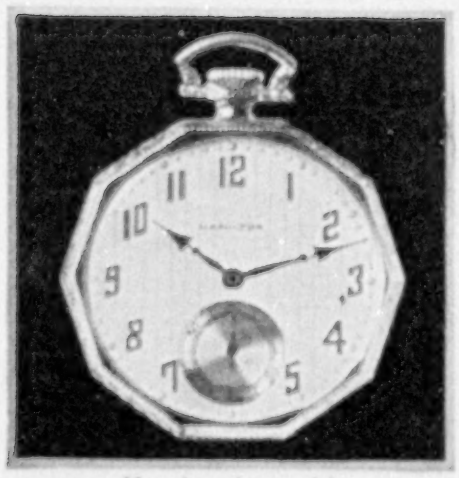
These two things—accuracy and beauty—are so well combined in a Hamilton that it is considered matchless by the country's best jewelers.



Men's strap watches at $50 and $75
Women's wrist watches, $46—$65

HAMILTON WATCH COMPANY, *Lancaster, Pa., U. S. A*

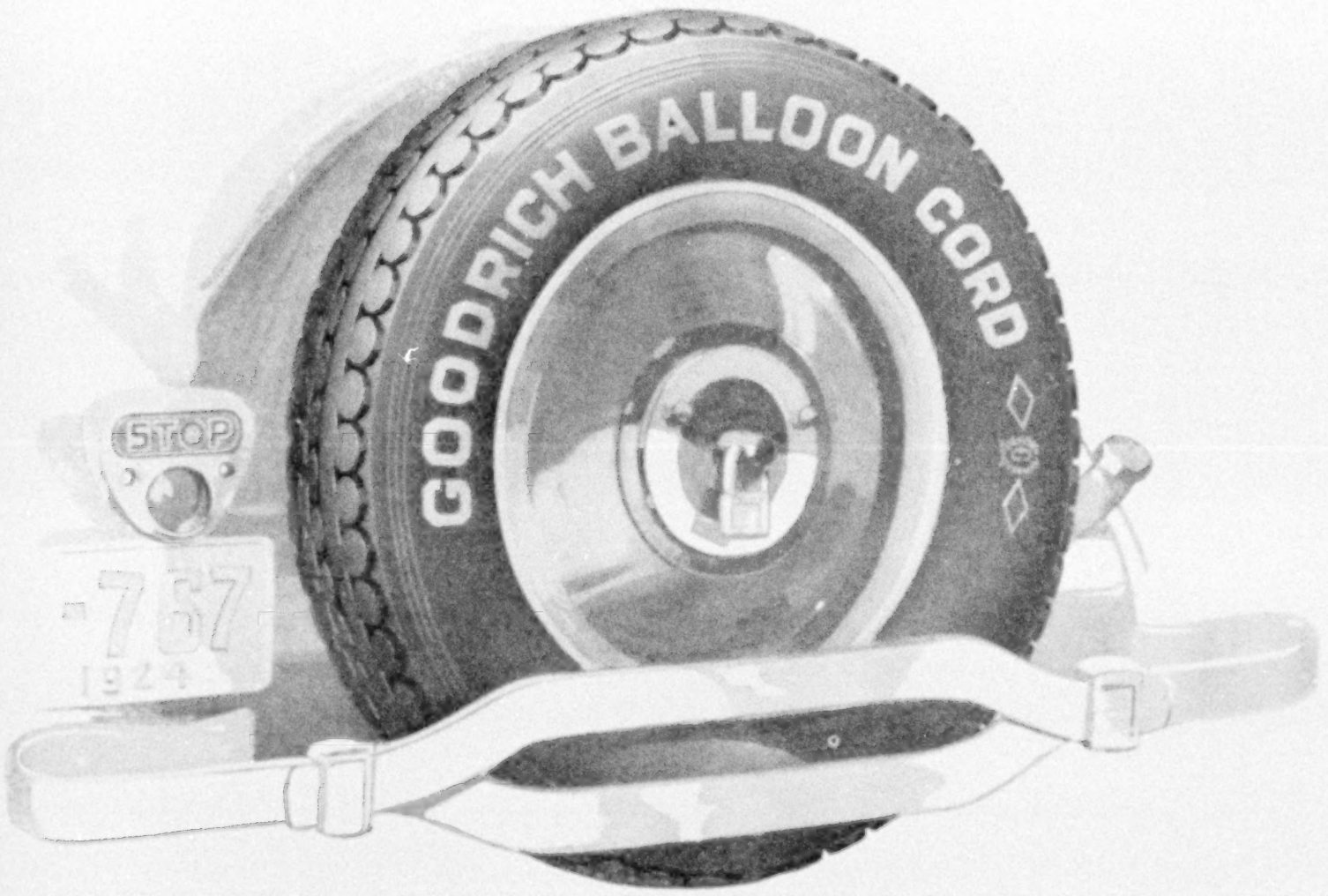
Send for a copy of our new illustrated booklet "The Timekeeper"



Hamilton thin models $46 to $250

Hamilton Watch

The Watch of Railroad Accuracy



Greater Goodrich Value

Through basic economies Goodrich offers you a greater Tire Value—in fact, the greatest in fifty-four years of manufacturing experience.

Goodrich distribution has been made more scientific—manufacturing methods have been improved—production and merchandising have been more finely organized. These achievements initiated by a sound and capable management have all worked for the greater good of the motor car owner.

You pay less today for Goodrich Quality . . . You get more service for fewer dollars . . . You get a Goodrich Tire fitted to your individual transportation needs—any type from small-sized fabrics to easy-riding, comfortable Balloon Cords.

Ask your Goodrich dealer about the new Goodrich values—see how much Goodrich economic accomplishments now contribute to lower motoring costs for you.

A Tire for every Transportation need · · · GOODRICH BALLOON CORDS · · · SILVERTOWN CORDS · · · COMMANDER CORDS · · · "55" FABRIC · · · TAXICORDS · · · HEAVY DUTY CORDS · · · SEMI-PNEUMATICS · · · DE LUXE CUSHION—TRACTOR TYPE · · · DE LUXE CUSHIONS · · · INDUSTRIAL TRUCK TIRES

THE B. F. GOODRICH RUBBER COMPANY, *Akron, Ohio*

In Canada: The B. F. Goodrich Rubber Company, Limited, Toronto

Goodrich Tires

"Best in the Long Run"

Radiotrons WD-11 *and* WD-12 *Made History!*

It isn't a genuine WD-11 unless it's a Radiotron.

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It isn't a genuine UV-201-a unless it's a Radiotron.

You Can Change Your Set to Dry Battery Operation.

If your radio set is equipped with navy type tube sockets, you can change to dry battery operation by inserting WD-12 Radiotrons. Ask your dealer for information as to how this can be done.

These are dry cell tubes—the tubes that made possible the swift progress of radio in the home everywhere. They meant clear tone—undistorted detection — radio and audio amplification — and volume reproduction — all with dry batteries. They meant radio in the city—on the farm — off in camp — everywhere!

And to-day, there are millions of these popular Radiotrons in use. Everybody knows them familiarly as "WD-11's" and "WD-12's." But they are not genuine unless they are RADIOTRONS.

Always be sure to look for that mark on the base, and for the RCA mark on the glass. It's important, whether you are buying a new set with the Radiotrons in it, or buying new Radiotrons to replace old ones. Then you have the genuine — sure to live longest—serve best.

Radio Corporation of America

Sales Offices:

233 Broadway
New York

Suite No. 359, 10 So. LaSalle Street
Chicago, Ill.

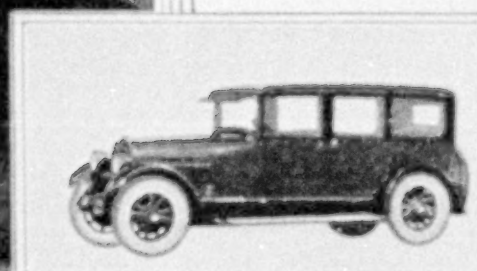
433 California Street
San Francisco, Cal.

RCA

This symbol of quality is your protection

Radiotron

REG. U. S. PAT. OFF.



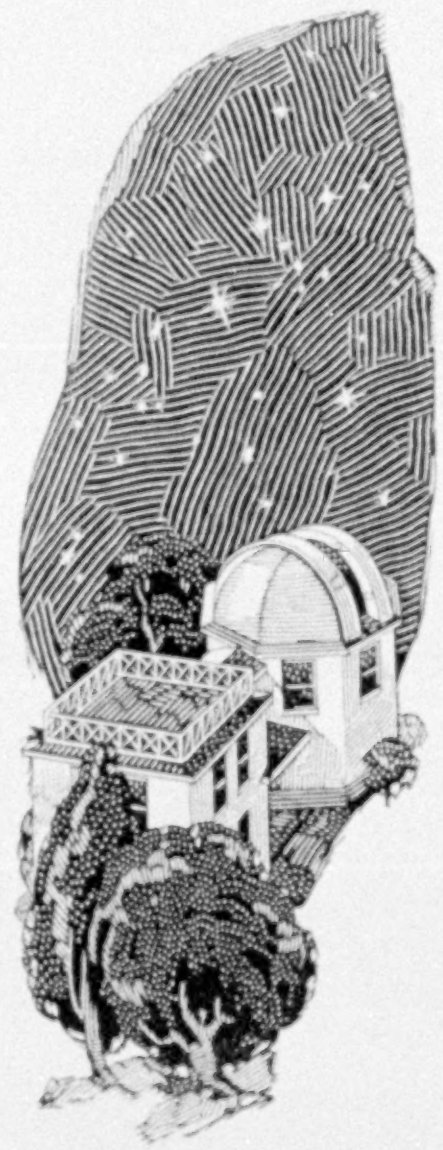
CADILLAC

One quality which women deeply admire in the Cadillac is its unrivalled capacity for *remaining young.* ¶ By that we mean the astonishing Cadillac ability to remain mechanically fit, smooth and quiet in operation, and consistently handsome and fashionable long after other cars must be replaced. ¶ Incidentally, it is this enduring excellence which stamps the new V-63 as the truly economical car and makes it the wise investment for people of moderate as well as unlimited means.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICH.
Division of General Motors Corporation

Standard of the World

ELGIN TAKES THE TIME FROM THE STARS AND PUTS IT IN YOUR POCKET



THE OLD HOMESTEAD OF FATHER TIME

ALL that we know about *time* the astronomers have taught us. The only absolute measure of time is the stately procession of the stars as the revolution of the earth brings them across the zenith.

But, for convenience in the everyday affairs of men, "time" must always mean what our *watches* tell us of the passing *human* hours, minutes and seconds.

So one of the great practical services of the astronomer today is to contribute star-time precision to the making of watches for men and women.

And as the Elgin Professional Watch Makers are never satisfied to do anything by halves, years ago they established a Time Observatory at the Elgin Watch Factory, for the sole purpose of taking star observations. And so supplying the most *precise time standards* to the making of Elgin Watches.

All through the Elgin Factories the electric sounders are reproducing the ticks of the Observatory Master Clock, checked by star-time.

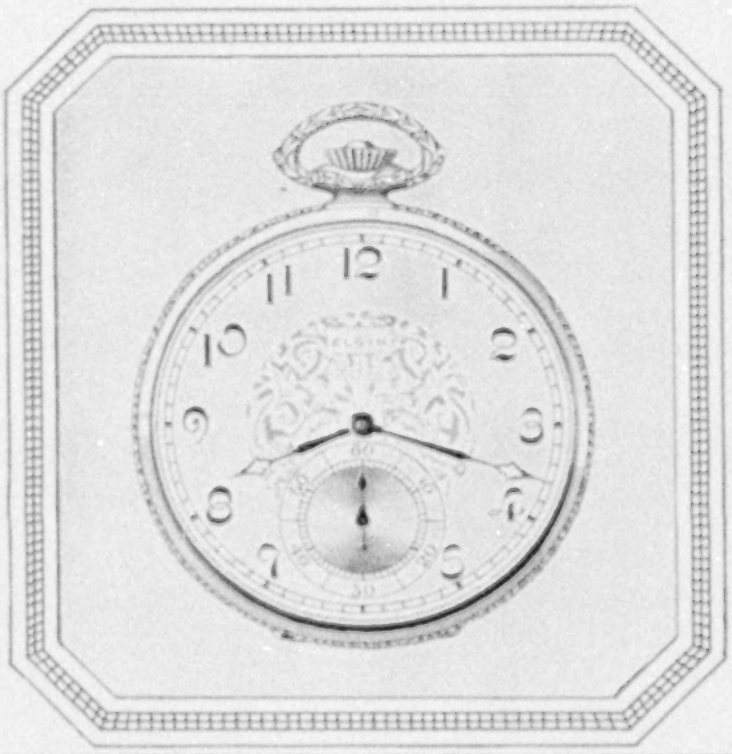
Every process in adjusting and timing the Elgin Railroad Watch carried by the conductor and engineer of your morning train was performed in the light of these standards.

So, too, with your own pocket watch; your Elgin Strap Watch; the Elgin Wrist Watch you give to wife or daughter. Not a single watch ever comes from Elgin but gains in *professional timekeeping character* from the work of the Elgin Time Observatory.

Nor is this all. To every man and woman in the Elgin factories, the Time Observatory is an *inspiration*—a constant reminder of their obligation to all who buy Elgin Watches.

The watch-owner, too, feels the inspiration in higher understanding of timekeeping standards, and the desire for *better and better watches*.

And the Time Observatory of the Elgin Watch comes in a peculiar and literal sense to be the "Old Homestead of Father Time."

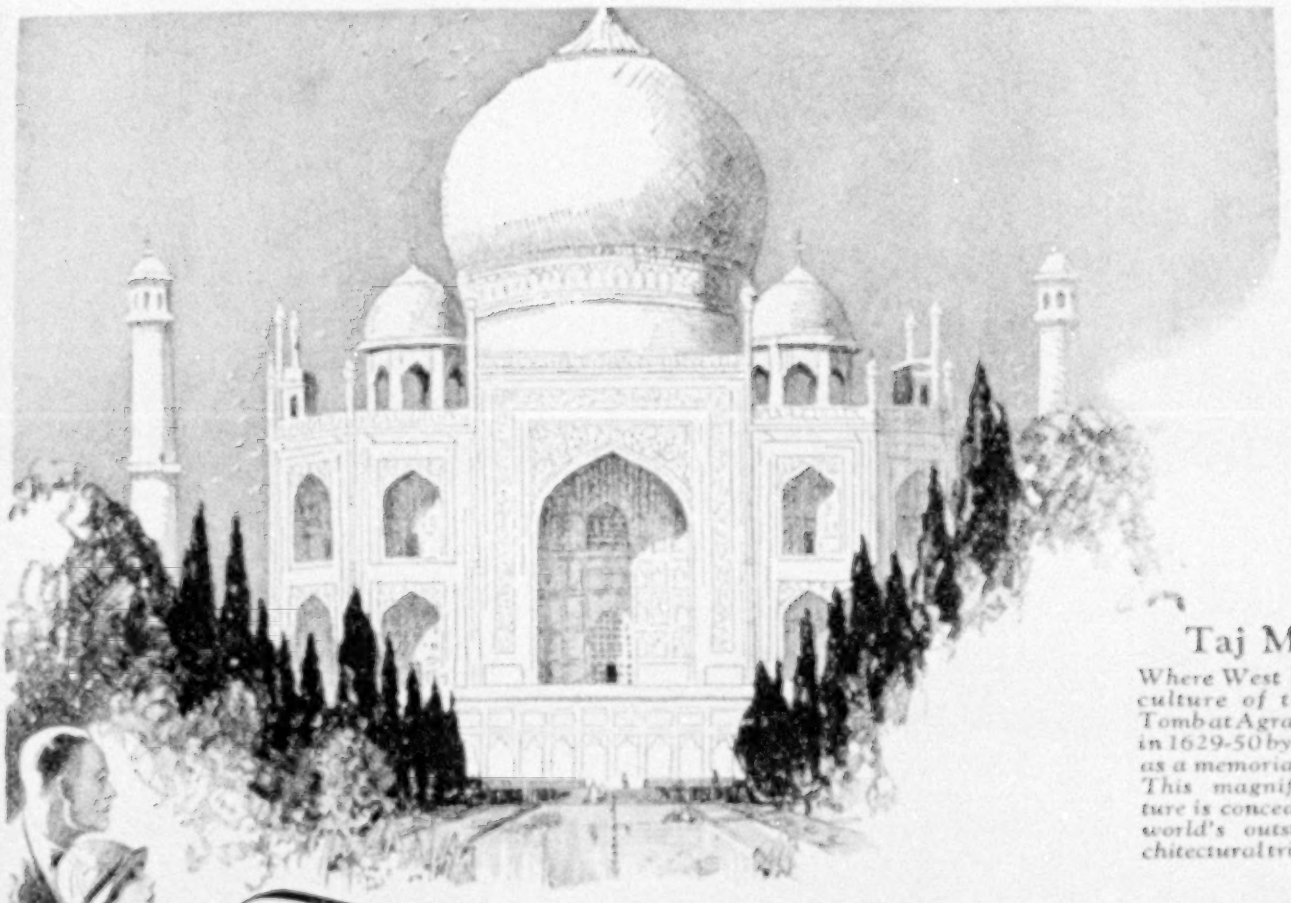


ELGIN

The Professional Timekeeper

The new model—extra thin Elgin "Streamline"—17 Jewel—adjusted, in white or green engraved, or plain polished green, 14-Karat gold-filled case—$40. In attractive gift boxes.

ELGIN NATIONAL WATCH COMPANY, ELGIN U·S·A



Taj Mahal

Where West bows to the culture of the Orient. Tomb at Agra constructed in 1629-50 by Shah Jehan as a memorial to his wife. This magnificent structure is conceded to be the world's outstanaing architectural triumph.

Follow the Trail that leads to the Remote Beauties of the World

The world is mine — said Monte Cristo. So may you say, too—if you join this joyous pilgrimage to the distant places.

Transport yourself into the midst of the austere beauty of Japan, the ancient charm of China, the bewildering babble of India, the stirring mystery of Egypt, the languorous moodiness of Italy.

Then fetter your imagination and be as practical as possible. Conceive yourself living on the *Belgenland*. See yourself surrounded with every luxury that the wit of man has contrived. See yourself living in greatest ease—all the more eager to accept the challenge of adventure that greets you at every interesting port on this alluring cruise.

Fascinating trips ashore under the masterly guidance of the American Express Company.

Apply for beautifully illustrated booklets. Red Star Line, No. 1 Broadway, American Express Company, No. 65 Broadway, New York, or other offices or agencies of either company.

Facts About the Cruise

Belgenland—largest liner ever to circle the globe, leaving New York Dec. 4, 1924, sailing westward via Los Angeles (Dec. 20) and San Francisco (Dec. 23). To 60 cities in 14 countries. 28,310 miles. 133 days. Back in New York April 16, 1925.

RED STAR LINE

WHITE STAR LINE · AMERICAN LINE

INTERNATIONAL MERCANTILE MARINE COMPANY

in cooperation with

AMERICAN EXPRESS COMPANY

Only Hudson and Essex Have the Coach

It Gives All Closed Car Comforts and at Open Car Cost

Full Size Balloon Tires

Standard Equipment

Naturally when balloon tires had established their superiority Hudson and Essex would adopt them. They are now standard equipment. They add an even greater measure of riding ease, steadiness and good looks to the notable values of the Coach.

It marks another margin of advantage in Hudson-Essex values that all acknowledge.

Be Sure to Get Parts Price List from Your Dealer

HUDSON-ESSEX parts prices are LOWER

So Why Buy an Open Car?

No need to accept an open car on the score of price. You pay no more for the Coach. It is exclusive to Hudson and Essex. It provides all the utility you can get in any closed car. It makes "Closed Car Comforts at Open Car Cost" the outstanding issue of the year. And because you can get its advantages in no other car it is the largest selling 6-cylinder closed car in the world.

It Is the Car for Everyone

Motorists are fast forsaking the open type. Everyone wants closed car advantages. The Coach is the quality car within reach of all. You must consider any purchase in the light of this irresistible trend to closed cars. You must judge what the resale value will be of any type that is passing from favor. The Coach, as the wanted type, maintains high resale value. Comparative values of used open and closed cars should tell you what type to choose.

Hudson and Essex are creations of the same engineers. They are built in the same factories, by the same workmen, under the same patents.

In materials and workmanship they are of one quality. In either you get all the utility any closed car can give, with the assured mechanical satisfaction of a famous chassis. And you pay less even than for an open car of comparable quality.

Hudson and Essex Are of One Quality

ESSEX SIX COACH $1000

HUDSON SUPER-SIX COACH $1500

Freight and Tax Extra

6 reasons why Remington Portable

is the recognized leader in sales and popularity

Take any user's advice and buy a Remington Portable

Durability and Reliability

The Remington Portable has won the endorsement of the world by its unequaled durability and reliability. You can count on it for years and years of faithful service.

Compactness and Portability

The Remington Portable is the most compact of all writing machines. When encased it is only 4 inches high, so it can be tucked away in a desk drawer or bookcase. It weighs but 11 pounds. It carries its table on its back, which makes writing easy and convenient in any place or position, even on your lap.

Four-Row Standard Keyboard

For fifty years the four-bank keyboard has been recognized as standard. The Remington Portable has always had the standard keyboard, with four rows of keys—no shifting for figures—exactly like the big machines—the keyboard universally adopted by business as the best.

Keyboards in thirty-two languages and for every occupational requirement.

Ease of Operation

You will be surprised how quickly you can master the operation of the Remington Portable. The four-row, standard keyboard, and the simplicity in design and construction of the entire machine make it incomparably easy to learn and to operate.

Beautiful Work Always

The writing of the Remington Portable is exceptionally beautiful. Even a beginner turns out work that is a revelation. This, of course, is due to the fine construction of the machine, and its habit of always being in perfect alignment.

Universal Service

Wherever language is written—on the six continents—you will find Remington service, for there are over 700 Remington offices throughout the civilized world. A Remington Portable owner knows that wherever he goes Remington service is near at hand. This feature is one that no portable typewriter buyer can afford to overlook.

* * *

ON every count—whether work, wear or service—the superiority of the Remington Portable is decisive. Sold by over 5,000 dealers and Remington branches everywhere. You can buy one on easy terms, if you wish. Write for our illustrated, "For You—For Everybody." Address Dept. 65.

REMINGTON TYPEWRITER CO.

374 Broadway, New York

Remington Typewriter Company of Canada, Limited
Main Office, 68 King Street W., Toronto

We believe we make the best typewriter ribbon in the world —and its name is PARAGON

CRUISES

NEXT WINTER

1925 1925

The West Indies

Three splendid Caribbean Cruises on the palatial 20,000-ton "Reliance". Shore excursions at almost every port included in the cruise-price. Visits Havana, Jamaica, Panama Canal, Cartagena, La Guayra, Caracas. Trinidad, Barbados, Martinique, St. Pierre, Virgin Islands, Porto Rico and Bermuda. Short cruise ($175 *& up*) sails January 13, 1925. Longer cruises ($350 *& up*) January 31 and February 28. *Write for booklets.*

Round South America

Next winter's most unusual voyage on the renowned cruise-ship "Resolute" (20,000 tons). The Panama Canal, the West Coast, the Straits of Magellan, East Coast and Caribbean. Sails January 24, 1925. 65 days. 15,000 miles. 23 ports and cities. $925 *& up.*

A remarkably comprehensive voyage. Visits the Andes, the Inca cities, the West Coast ports, the supreme Straits of Magellan, the splendid East Coast capitals, the Amazon River, the Spanish Main and the Antilles.

The "Resolute" is the largest and finest ship ever to cruise to South America, especially adapted for Southern waters—swimming-pool, spacious decks and public rooms, an unusual variety of staterooms.

The Mediterranean

Two cruises to the vivid ports of South Europe and North Africa. "Samaria" (20,000 tons) on Feb. 5. "Reliance" (20,000 tons) on Mar. 28.

In addition to the "standard" ports, the "Samaria" will visit Tunis, Palermo, Cattaro and Venice. The famous trip to Granada and the Alhambra is included. 24 ports and cities. $875 *and up.* Send for book.

The "Reliance" will cruise for five weeks during the luxuriant Mediterranean Spring, visiting Madeira, Spain, Algeria, Tunisia, Italy, the Riviera. Ample shore excursions. $675 *& up.* Send for book.

An outstanding feature of the "Samaria" Cruise is a visit to Nice in Carnival Time with its parades, confetti battles and masquerades.

Raymond-Whitcomb Tours

Our Round the World Tours are of exceptional scope; they include such unusual places as Siam, Cochin-China, Cambodia and Kashmir. One pre-eminent tour visits the South Sea Islands, Australia and New Zealand, South Africa, the East African Coast, the Sudan and Egypt. Other Tours to South America, Europe, California, Hawaii, Florida, etc.

Write for our Tour Booklets and for our "Guides to Travel", which explain in detail the helpful features of our "Individual Travel Service".

RAYMOND & WHITCOMB CO.

Beacon & Park Sts. - Boston

BOSTON NEW YORK PHILADELPHIA CHICAGO LOS ANGELES SAN FRANCISCO

FACTS ABOUT A FAMOUS FAMILY

Frigidaire maintains an even temperature, colder than that of ice itself, and keeps food fresh, pure and healthful.

What? A refrigerator too?

ONE of the products of General Motors is Frigidaire, the modern electric refrigerator, made in Dayton, Ohio.

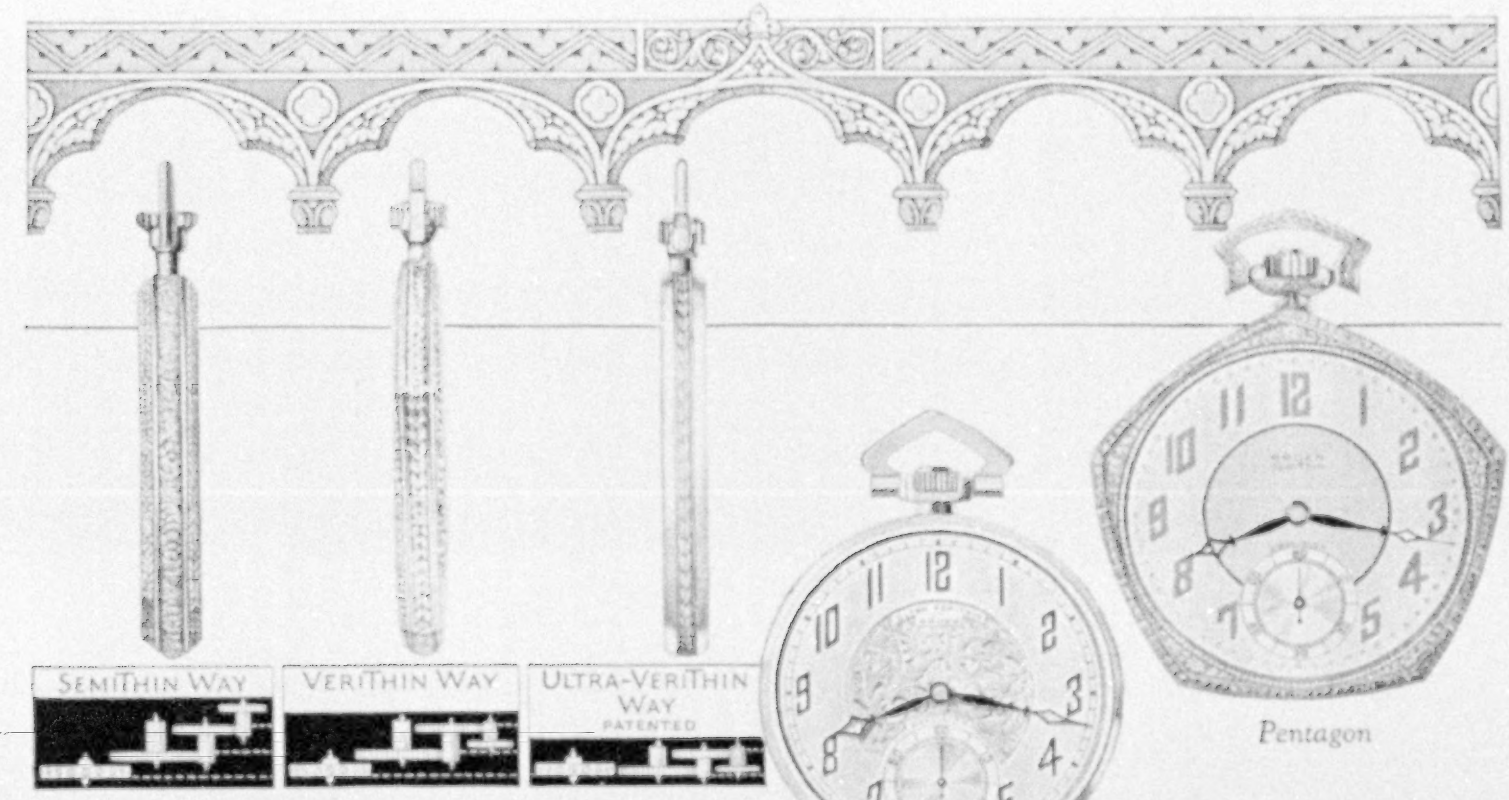
In Dayton also General Motors makes the Delco-Light electric plant—and the Delco-Light electric water system, and the Delco-Light electric washing machine.

These efficient servants, with the motor-cars and trucks of General Motors, have helped to transform city and country living—a significant evidence of what a group of companies can do, when their scientific research and their resources are united in one strong family.

GENERAL MOTORS

BUICK · CADILLAC · CHEVROLET · OAKLAND
OLDSMOBILE · GMC TRUCKS

Delco-Light products (including Frigidaire) and the cars and trucks of General Motors may be purchased on the *GMAC* Deferred Payment Plan.



Wheel train diagram, showing how the four operating planes of the ordinary watch are reduced to three in the Gruen VeriThin and two in the Ultra-VeriThin. Thus thinness is secured without loss of accuracy or durability of parts

Empire 50

Pentagon

SemiThin, VeriThin, Ultra-VeriThin

What they mean to the man who buys a watch

There are three general types of men's pocket watch made by the Gruen Watch Makers Guild. They are the SemiThin, the VeriThin, and the Ultra-VeriThin.

These are trade names. They are the property of the Guild and may be applied only to Gruen Watches.

Each represents a different degree of thinness and a different grade of watch movement. And each, at the price for which it is sold, represents the highest value that may be obtained in men's watches.

The SemiThin, priced as low as $25 and up, is a practical watch for the man who desires a good timekeeper at moderate cost. Nowhere else can such value in quality of movement and case be found below $35.

With the usual four operating planes reduced to three, the VeriThin becomes gracefully thin without loss of accuracy or durability. At $50 up, there is no watch made as thin that equals it in value, due to quality of parts and superior mechanical construction.

In the Ultra-VeriThin, at $100 up, the operating planes are further reduced to only two, without the slightest loss of accuracy or durability of parts. No watch of this thinness and character has ever been offered for less than $250.

If you are about to buy a watch for yourself or for some beloved person whom you mean to honor, why not see these watches before you make your final choice?

In nearly every community, the better jewelers can show you the watches pictured here, as well as a variety of other Guild models—their stores are marked by the Gruen Service emblem shown below.

In the event of any accident to your Gruen Watch, these same jewelers can repair it quickly and easily at a very moderate cost.

Pentagon, VeriThin—White or green gold reinforced, engraved, "Precision" movement, $75; 14kt solid green gold, $135; 18kt solid white gold, $165. Can also be had in plain case.

Empire 50, Ultra-VeriThin, "Precision" movement—Solid green or white gold, $100. Case inlaid with fine enamel, $110.

By Invitation Member

Emblem of BUSINESS CHARACTER

Rice Leaders of the World Association

Representing High Standing in NAME—PRODUCT—POLICY

GRUEN *Guild Watches*

1874—Fiftieth Anniversary Year—1924

GRUEN WATCH MAKERS GUILD
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Canadian Branch, Toronto
Engaged in the art of watch manufacturing since 1874

Dwight P. Robinson & Company

Incorporated

Engineers and Constructors

New York

Design and Construct

Steam Power Plants

Industrial Plants

Railroad Shops and Terminals

Hydro-Electric Developments

Transmission Systems

Construction of

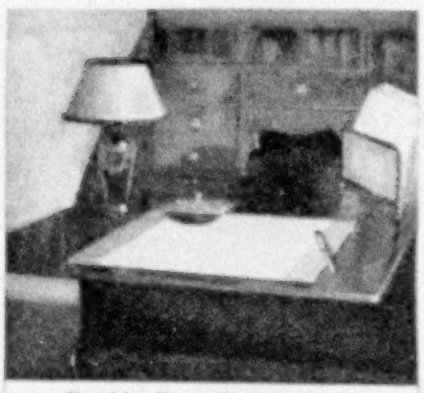
Office and Apartment

Buildings

Montreal

Chicago Philadelphia Youngstown Rio De Janeiro Atlanta Los Angeles

NOT THIS



BUT THIS

To make Rugs Safe from **Spilly Inkwells**

Have a Duofold on the Home Desk

For the young folks' school work—
for your own writing, too

No variation in hands can distort this jewel-smooth point
—Guaranteed 25 years

HITHERTO it has been the custom to use an inkwell and ordinary pen on the writing desk at home because the point of a fountain pen would soon turn awry if different hands wrote with it.

But this super-writer—the handsome Duofold Pen—has created a new situation that makes spilly inkwells unnecessary. For here is a point no style of writing can distort. That's why Duofold is used to register guests at clubs and hotels. A point of extra thick gold tipped with polished Iridium—guaranteed 25 years not only for mechanical perfection—but WEAR!

So now are thousands of Duofolds not only carried in the pocket and the hand-bag, and worn on the chatelaine, but thousands of writing desk Duofolds are left where all the family can freely use them.

Whenever there's writing to be done, they eagerly turn to this clear rapid writer. Its balanced symmetry and jewel-smooth point make life-long friends with the hand.

No pen but Parker has this Press-Button Filler, capped inside the barrel—out of sight—out of harm's way. No other has the Parker Duo-Sleeve Cap—an extra sleeve for an Ink-Tight seal. So look for this stamp on the barrel—"Geo. S. Parker—DUOFOLD—Lucky Curve." Then imitations can't deceive you.

All good pen counters sell Duofold on 30 days' approval
It's replacing old pens by the thousands

THE PARKER PEN COMPANY · JANESVILLE, WISCONSIN

NEW YORK, CHICAGO · *Parker Duofold Pencils to match the Duofold Pen, $3.50* · SAN FRANCISCO, SPOKANE

THE PARKER FOUNTAIN PEN COMPANY, LIMITED, TORONTO, CANADA

Parker Duofold

LUCKY CURVE

OVER-SIZE $7

With The 25 Year Point

Red and Black Color Combination Reg. Trade Mark U. S. Pat. Office

Duofold Jr. $5
Same except for size

Lady Duofold $5
With ring for chatelaine

Lady Duofold $5
A New Style Touch
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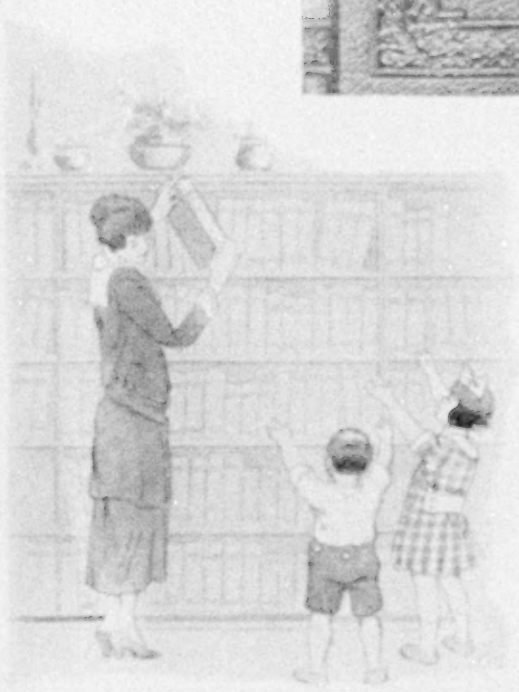

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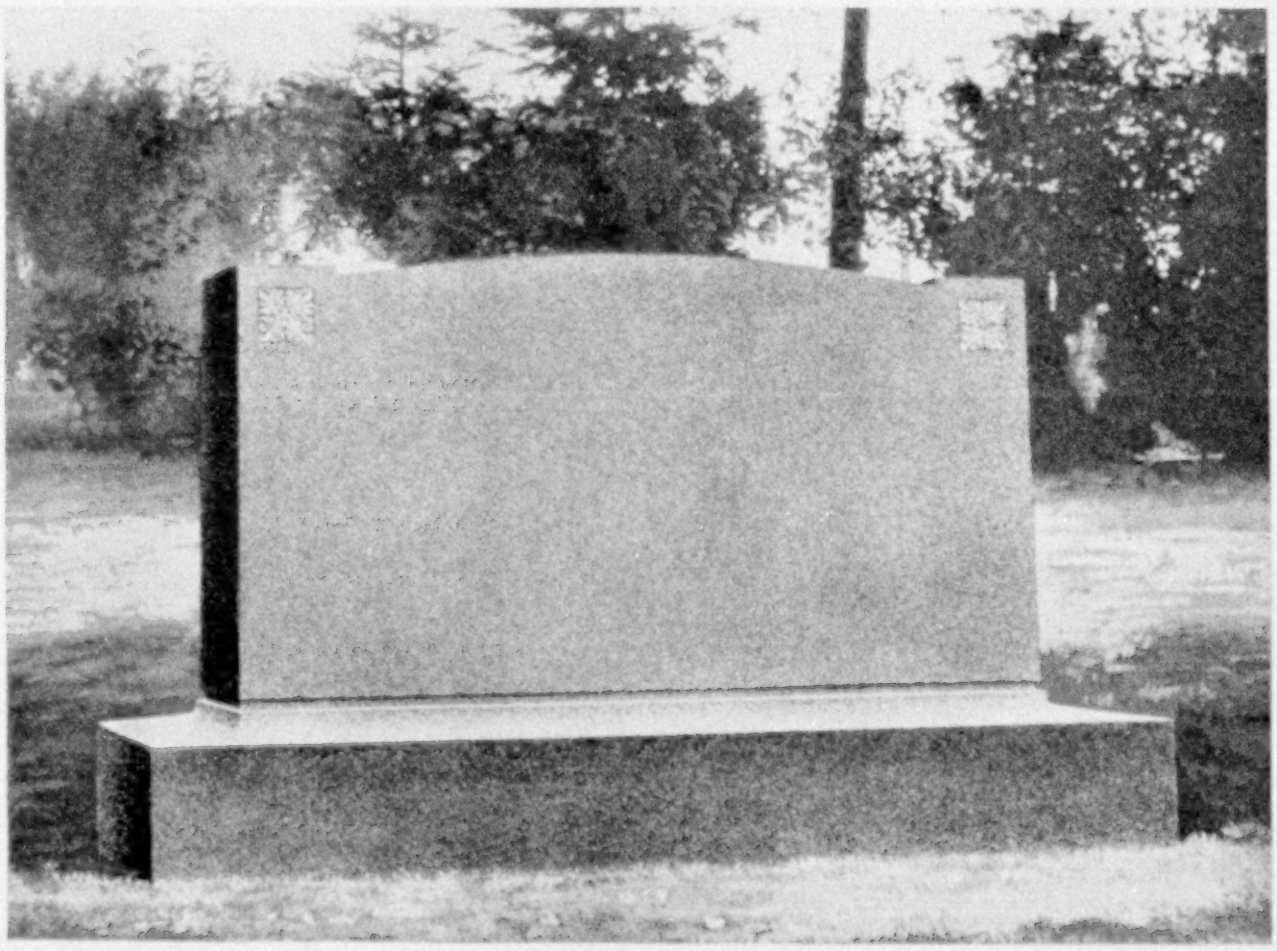

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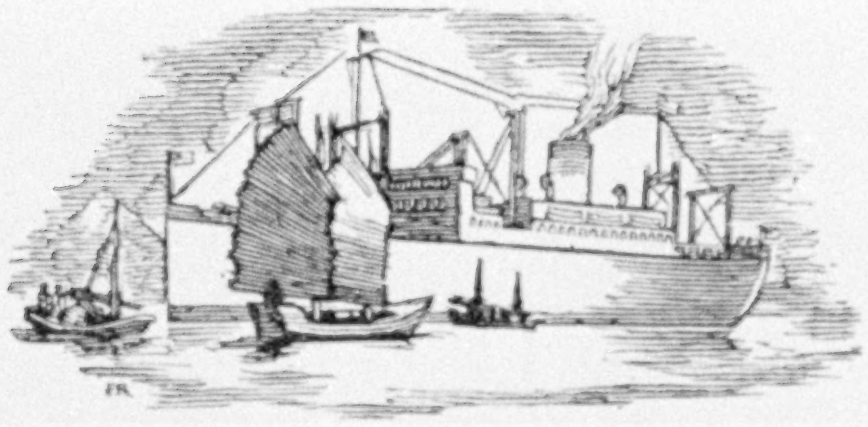

"THE MEDITERRANEAN ERA *died with the discovery of America; the Atlantic Era has reached the height of its developement; the Pacific Era, destined to be the greatest, is just at its dawn.*"

—THEODORE ROOSEVELT

Swiftly, on the Pacific Ocean, is growing the greatest commerce the world has ever seen.

Three-quarters of the earth's population are awakening to a recognition of new wants. They are demanding food, clothing, machinery. In exchange, they have billions in raw materials and manufactured articles to send us.

Already, Japan alone makes annual shipments to the United States amounting to over 300 millions of dollars and imports from us goods to the value of 360 millions.

Our trade with Japan has trebled in a decade.

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For the year ending June 30, 1923, the trade record of the United States with various countries on the Pacific showed:

	Exports to U. S.	Imports from U. S.
China	$169,619,408	$96,851,718
Australia	54,727,517	96,310,785
Alaska	52,984,275	29,981,604
Philippines	74,757,909	44,054,419
Dutch East Indies	48,575,781	9,976,420

It has made beginnings with Siberia, richest in possibilities of all trans-Pacific lands.

And of our Pacific Coast commerce with the Orient, today more than two-thirds flows through the ports of the Pacific Northwest!

With the growth of this commerce the Pacific Northwest ports are growing—and will continue to grow with constantly increasing speed. For they themselves mark the path which the huge bulk of our trade with Asia must for all time follow. Here are the definite advantages that assure this fact!

The Pacific Northwest ports are nearer by several days' sailing to Japan, to China, to the Philippines, to Siberia, than the South Pacific ports.

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The growth of the ports of Washington and Oregon is reflected in the development of the entire Pacific Northwest, where the population is increasing more than twice as fast as that of the United States as a whole.

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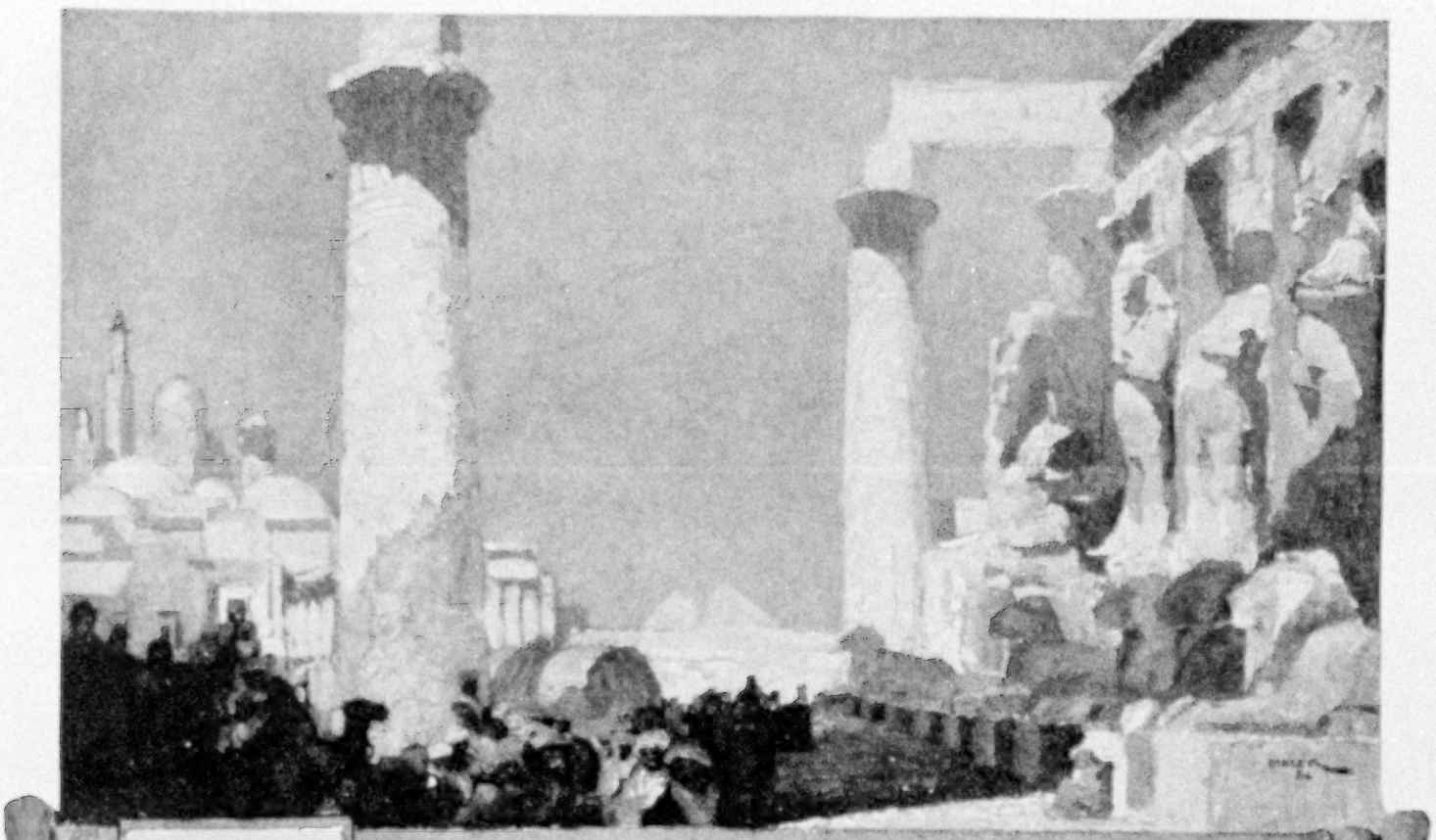

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SCATTERED over the seven seas is a series of Ports. Like Port Said, each port is a gateway. It leads into some far country—reveals some strange culture—goes back to some epochal history. It is an entrée to romance.

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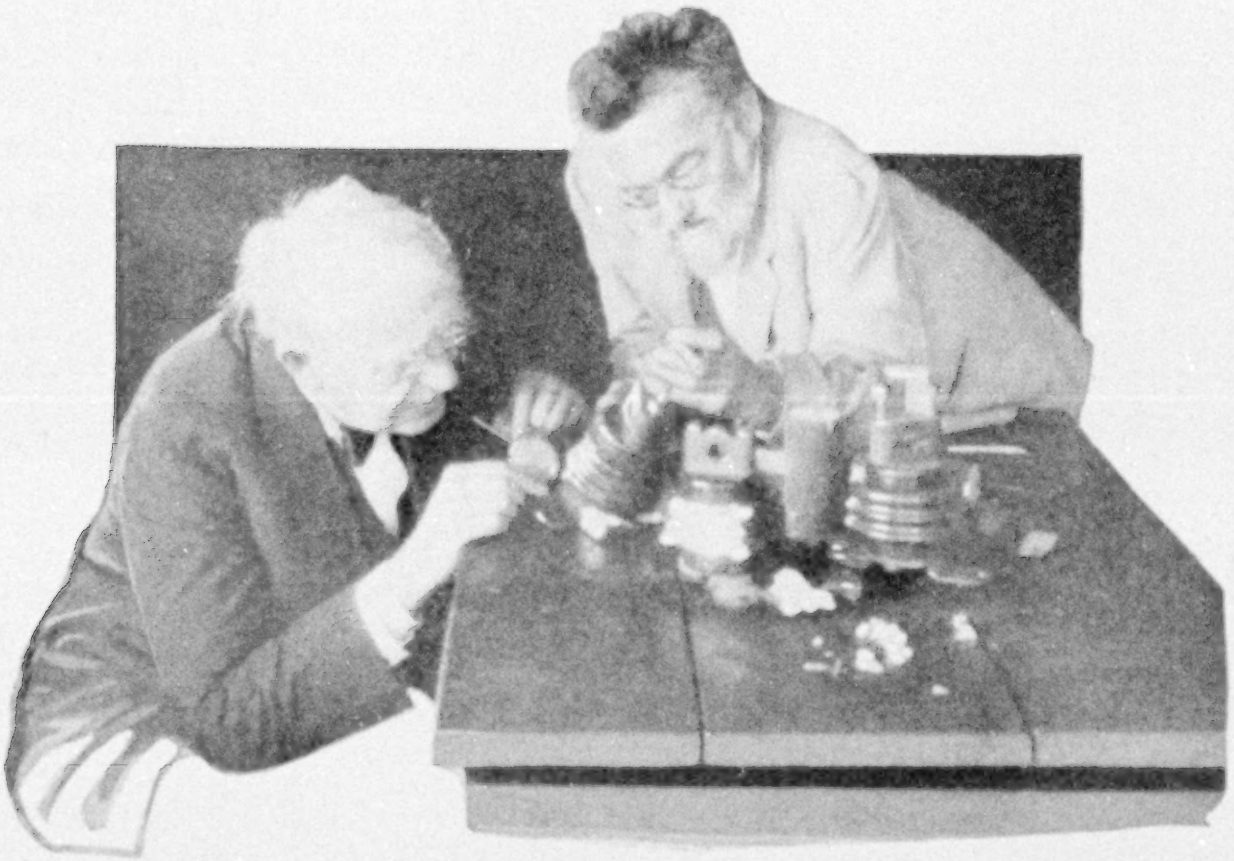
MADISON COOPER, Editor, 24 Court St., Calcium, N. Y.



Thomas A. Edison and Charles P. Steinmetz in the Schenectady laboratories of the General Electric Company, where Dr. Steinmetz did his great work.

Steinmetz

The spirit of Dr. Steinmetz kept his frail body alive. It clothed him with surpassing power; he tamed the lightning and discharged the first artificial thunderbolt.

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Emerson tells how the mass of men worry themselves into nameless graves, while now and then a great, unselfish soul forgets himself into immortality. One of the most inspiring influences in the life of a modern corporation is the selfless work of the scientists in the laboratories which it provides for their research.

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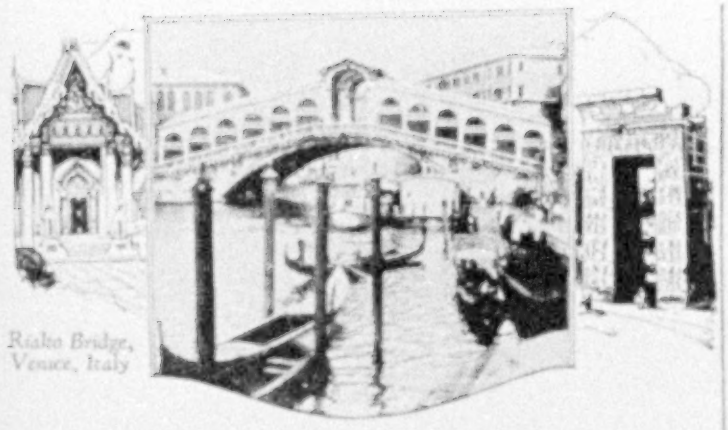

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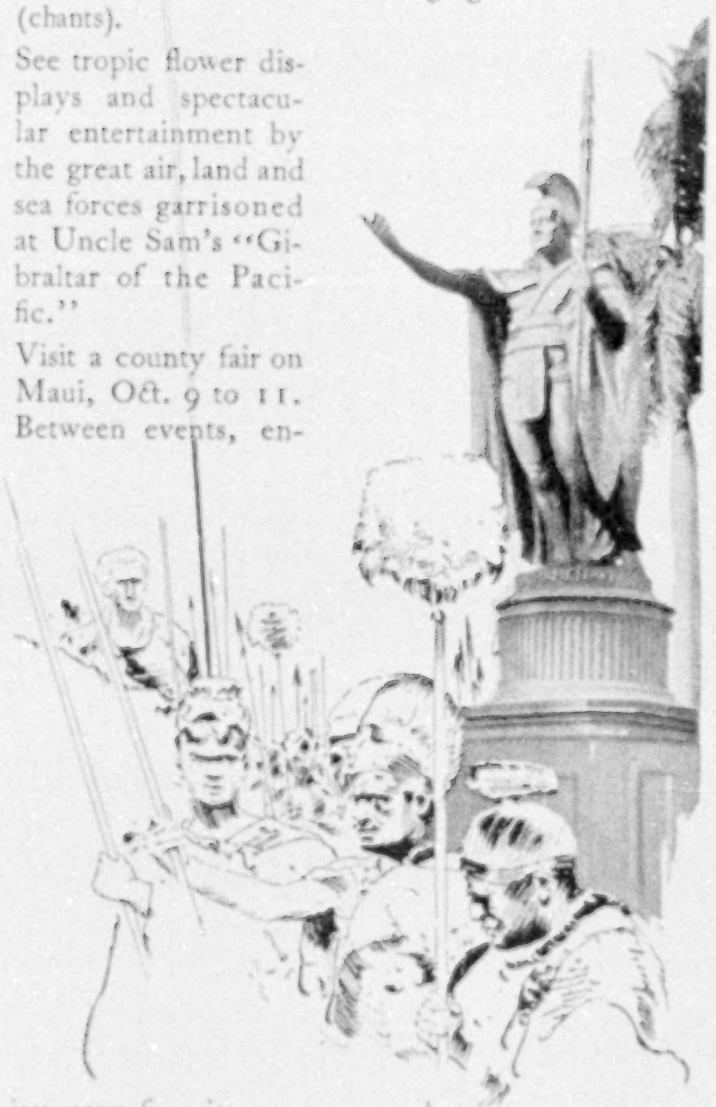

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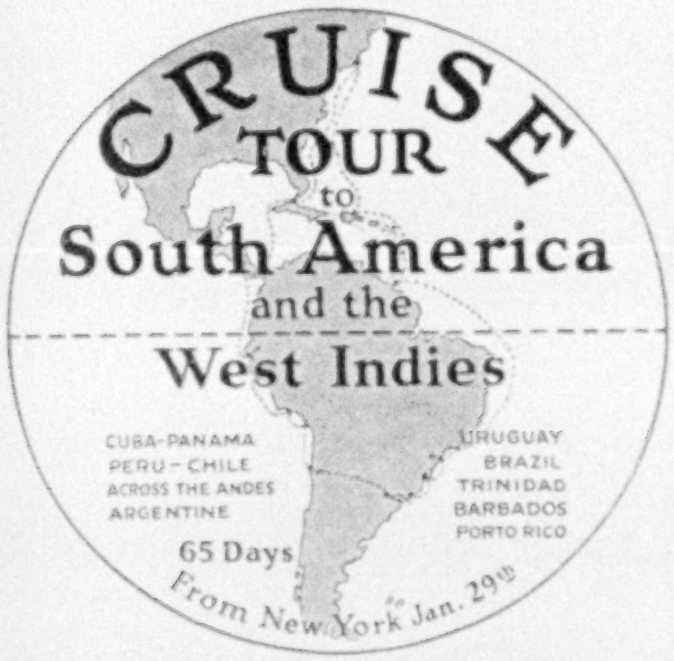

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Good Teethkeeping

YOUR teeth—how about them? How long since you have had them carefully examined? Do you ever go to the dentist except when riotous pain sends you?

Science has learned that bad teeth may cause any one of a dozen or more serious ailments—rheumatism, joint trouble, neuritis, neuralgia and heart disease.

PLAN NOW

And it doesn't take a mouth full of diseased teeth to cause acute trouble. One single cavity—if neglected—may be sufficient. This is what happens: A bit of food lodges in a tooth. Decay begins. As the cavity grows larger, the millions of germs which are always present in the mouth go trooping into the tooth. Before long the breaking down and decay of the inside structure of the tooth permit the germs to reach the pulp which is filled with blood vessels and nerves. The germs are picked up by the blood and given a tour of the body. Some of them debark in the heart. Others get off in the joints. Still others call out their station in the lungs or kidneys. Many times the result is years of pain. Sometimes a crippled body. Sometimes—death. All may come from a neglected tooth cavity!

Real trouble is often hidden

There is another source of trouble that is nearly always unsuspected—infection at the roots. This may happen to a tooth that never has been filled. Devitalized teeth—teeth from which the pulp has been removed—and teeth which have been improperly filled frequently develop abscessed roots which pour virulent poison into the system. This often goes on quietly without causing the slightest local pain, although intense agony may be felt in other parts of the body from the effects of the poison.

If you have bridges or crowns, it is well to suspect the foundation and have these teeth X-rayed.

Now what about the children?

Half of the total number of the school-children in United States and Canada have badly diseased teeth which are a definite menace to their health. We can save such children from the suffering and illnesses that we have had, if we all work together for them. How? By teaching children to have clean mouths, and by clean mouths is meant not only clean teeth but clean gums. We must teach them to brush their teeth regularly for two minutes at least twice a day—after every meal if possible.

And we must see that they eat proper food. Milk, eggs, whole wheat bread, fresh vegetables and green foods of all kinds contain the lime needed to build strong, healthy teeth. If mothers-to-be will eat plenty of the foods which contain lime, their children will have better teeth.

Your dentist—if he has studied modern methods—will know what to do about teeth which are diseased. Visit him regularly every six months. It is cheaper and less painful to have a little work done twice a year than to wait until neglect has developed a serious condition.

Preventive dentistry—oral prophylaxis—is still new to many people. It is a great step in the work being done for public health. Every year taxpayers are assessed hundreds of thousands of dollars for the re-instruction of children who have failed to be promoted because physical disabilities—frequently caused by the teeth—held them back. Teaching mouth hygiene in the schools—with tooth-brush drills and regular twice-yearly examinations and reparative work—will remove much of the disability and save the taxpayers' money.

Oral hygienists are trained to clean the teeth of school children and to teach them to take proper care of their mouths.

What is your particular community doing to promote oral prophylaxis for the school children? Local clubs and organizations are helping school boards to introduce oral hygiene into the public schools. This rapidly growing interest is making for a better educated, healthier, happier people. The Metropolitan Life Insurance Company will be glad to mail, free, a copy of a booklet, "Care of the Teeth" to anyone who requests it.

HALEY FISKE, *President.*

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VOL. XLVI, No. 3 WASHINGTON SEPTEMBER, 1924

THE NATIONAL GEOGRAPHIC MAGAZINE

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CROSSING THE UNTRAVERSED LIBYAN DESERT

The Record of a 2,200-Mile Journey of Exploration which Resulted in the Discovery of Two Oases of Strategic Importance on the Southwestern Frontier of Egypt

BY A. M. HASSANEIN BEY

With Illustrations from Photographs by the Author

The journey of Hassanein Bey, graduate of Oxford University and now First Secretary of the Egyptian Legation in Washington, from Sollum, on the shores of the Mediterranean, to El Obeid, in the Anglo-Egyptian Sudan, a distance of 2,200 miles, has been characterized by the Director of Desert Survey, Egypt, as "an almost unique achievement in the annals of geographic exploration."

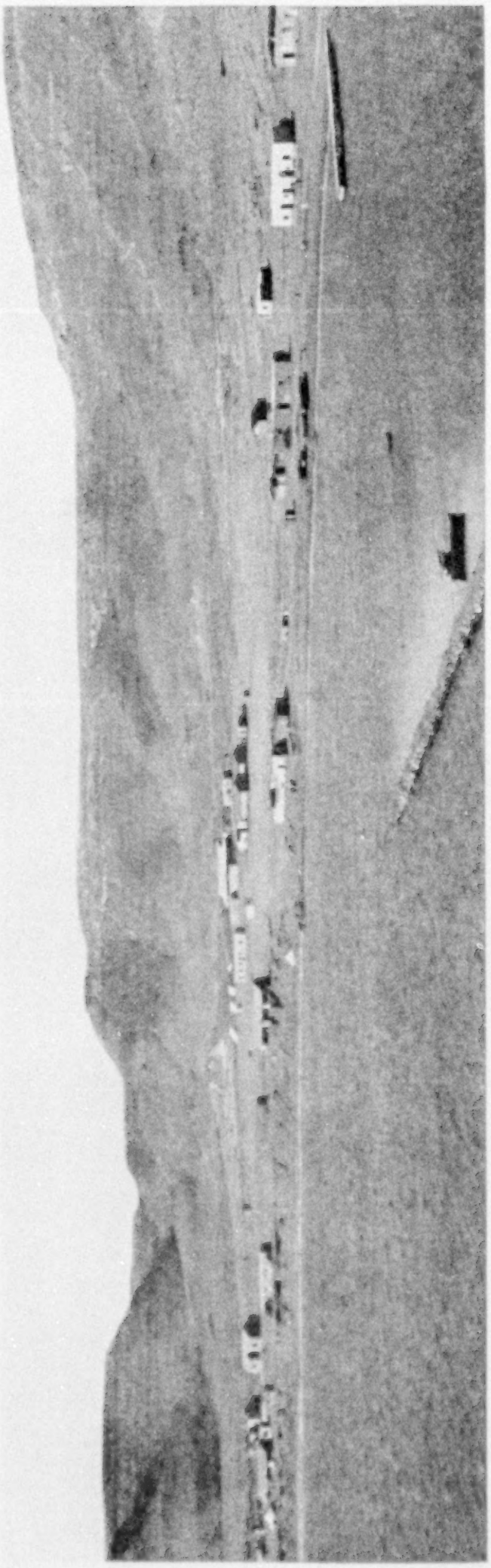
The expedition was undertaken with the encouragement of His Majesty King Fuad I of Egypt, a member of the National Geographic Society. His support took the form of a grant of leave of absence to Hassanein Bey from the civil administration of Egypt, and the expenses of the expedition were subsequently defrayed by government grant.—THE EDITOR.

TO HIM who has the wanderlust, no other actuating motive for exploration is needed than the knowledge that a region is unknown to civilized man; but for my trip from Sollum to El Obeid, through the hitherto untraversed Libyan Desert, I had the additional incentive of exploring the western frontiers of my native Egypt and of the Sudan.

After my desert journey to the Oasis of Kufra in 1921, my sovereign manifested special interest in a proposed undertaking to bridge the gap between Kufra and El Fasher (see map, page 236).

Therefore, on December 21, 1922, I landed in Sollum and organized the nucleus of a caravan which was to take me on a trip, occupying more than six months, through the Libyan Desert, that vast expense of arid land lying to the west of the Nile Valley, from the Mediterranean coast down to the Sudan.

The Libyan Desert is inhabited in the north, down to Kufra, by white Bedouin Arabs. The Arabic word "Bedouin" means "dweller of the desert," as opposed to the "dweller of the city." Nowadays, however, it has come to mean any man who goes from one place to another to graze his cattle in the desert. It is used equally for the white Bedouin and the black Bedouin—anybody who lives the



SOLLUM, A SMALL MEDITERRANEAN PORT NEAR THE NORTHWESTERN FRONTIER OF EGYPT, FROM WHICH HASSANEIN BEY BEGAN HIS 2,200-MILE CAMEL TREK

In the foreground is the harbor breakwater. The small houses are the quarters of Egyptian officials. In the background is the Egyptian hospital. From the sea rises a precipitous plateau, beyond which lies the desert.

roaming life of those sterile wastes.

In the south, this region is inhabited by tribes of blacks—Tebu, Goran, and Bidiat (see illustrations, pages 268 to 275)—who are rather more refined in features than the central African negroes.

THE SENUSSI, A SECT, NOT A PEOPLE

The reader sees always connected with the Libyan Desert the word *Senussi*. Many people think the Senussi are a tribe or a people. In reality, they are a sect of the Moslem religion embracing all the tribes of Cyrenaica and having influence in North Africa and the region south of Kufra. It is a comparatively recent sect, being only about 80 years old.

Its founder, Sidi Mohammed Ibn Ali El Senussi, came from Algeria about 100 years ago. On his long journey to Mecca he saw that there was a fertile field for his teachings in Tripoli and Cyrenaica. He established the famous University of Jaghbub (see page 238) and preached a very primitive and pure form of Islam, shorn of all luxuries. The devotees were not even allowed to drink coffee or smoke, and up to ten years ago the man caught smoking was severely punished, sometimes to the extent of having one of his hands cut off.

It has been said by explorers that the tribes of Cyrenaica, who are all under Senussi influence, are actuated by religious fanaticism when they refuse foreigners permission to enter their territory. To my great interest, however, I discovered that not religious, but patriotic, fervor is the impelling principle. Their reasoning is simple. They do not want *any* aliens to come into

MXUM

STONE HOUSES OF SIWA, ONE OF THE MOST HISTORIC OASES OF NORTHERN AFRICA

The lofty structures indicate that Siwa was at one time a point of defense from desert tribes. In the middle distance, slightly to the right, is the covered market-place. Siwa was noted for its Temple of Ammon even before the time of Herodotus, and Alexander the Great came here to consult the oracle.

Drawn by A. H. Bumstead

A SKETCH MAP SHOWING THE ROUTE OF HASSANEIN BEY THROUGH THE LIBYAN DESERT

The results of the author's journey include the determination of the exact positions of the wells of Zieghen and the Oasis of Kufra, resulting in changes of 62 and 24 miles respectively from the positions hitherto assigned to these places on maps of Africa; the discovery of the oases of Arkenu and Ouenat, previously unknown; the discovery of a route from southwestern Egypt across the Erdi Plateau of French Equatorial Africa into Darfur, and the determination of elevations along the entire route.

the country, for they say foreigners mean domination, domination means paying taxes, and they do not want to pay taxes! Therefore, the best way to avoid taxes is to prevent any stranger from entering the region.

Now, who are the outsiders who come to their country? They are European explorers — Christians. Therefore, no Christians are permitted to enter.

Explorers had been forbidden to go into the interior, and with the exception of the German scientist Rohlfs, who in 1879 boldly ventured to Kufra but escaped with little more than his life, this prohibition had been effective. But when I, a Moslem, the son of a religious man and a friend of their head man, arrived, they scratched their heads. Here was a foreigner whom they did not want, but they could not convict him on religious grounds. I had to be tolerated, temporarily at any rate.

My first objective from Sollum was

THE ARMED MEN OF THE CARAVAN

Hassanein Bey is mounted upon his Arab horse Baraka (see text, page 245).

Siwa, where I arrived after a nine days' trek. This is one of the oldest oases of the Libyan Desert, and the most prosperous because of its date trees and its numerous springs. Its geographical position has made it a center for Bedouins trading between Egypt and the interior of Cyrenaica.

IN THE OASIS OF SIWA, WHERE THE CARAVAN WAS ORGANIZED

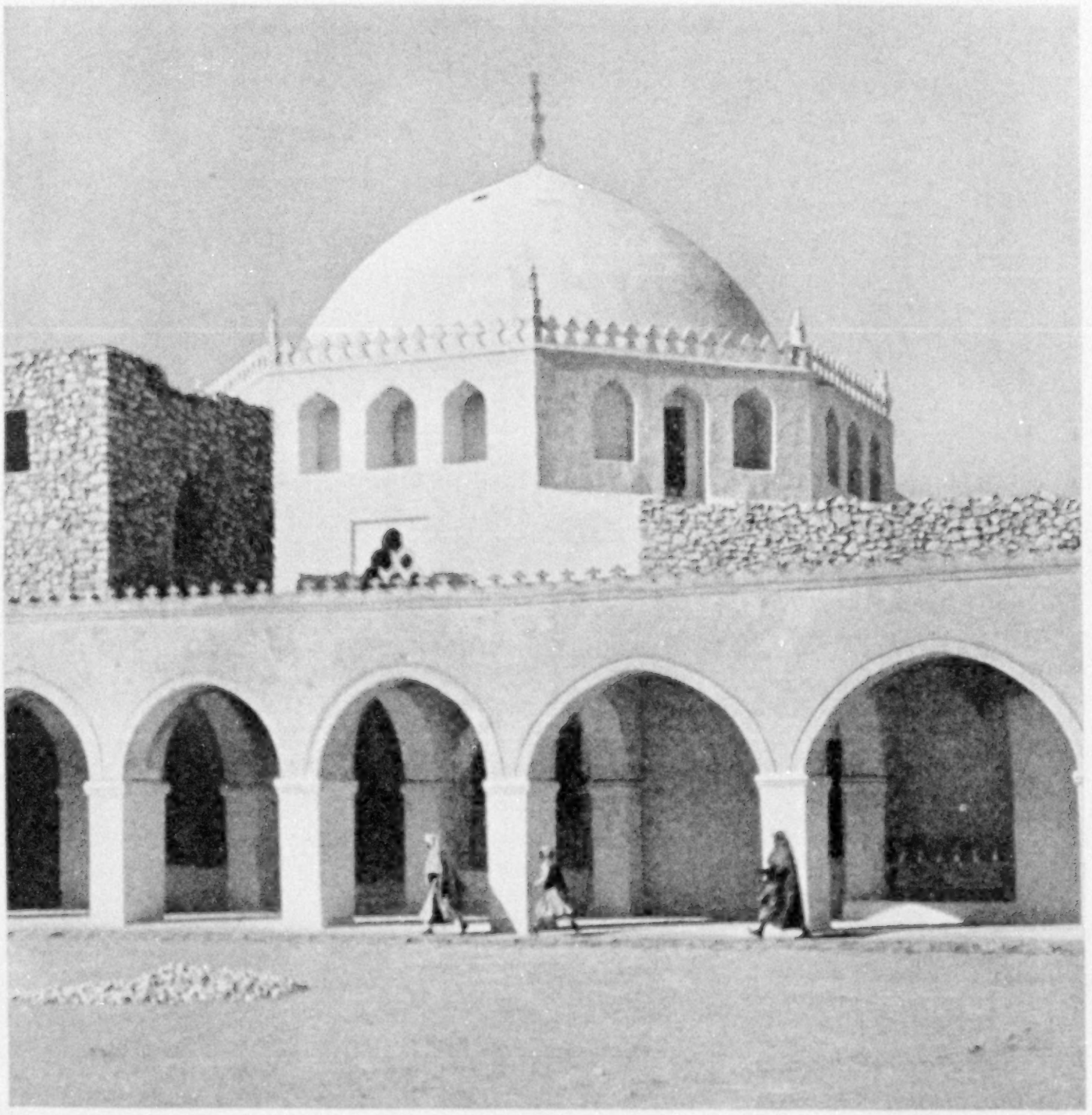
Here one still finds the old houses built on the hilltop to ward off attacks (see illustration, page 235); but now it is a very peaceful place, inside Egyptian territory. The chief occupation of the inhabitants is the cultivation of dates. Olive trees are also grown and olive oil extracted.

The dates of Siwa are famous all over the world. A visit to the date market reveals a curious communistic custom that prevails here. Everybody, rich and poor, brings all his dates, good and bad, and puts them in heaps, and no one dares touch one date from another man's heap, for it would bring bad luck. On the other hand, they allow any stranger or any poor man to come in and eat as much as he likes from the best quality, provided he does not take any away with him. Therefore, nobody starves at Siwa.

Some of the women are unusually comely. They dress in very loose garments and adorn themselves with necklaces of silver bangles. Photographs of some of these Siwa girls suggest that they follow the most modern form of coiffure, but the hair is not bobbed, although it has the same effect. It is plaited when the child is young, and the braiding continues as the hair grows. The locks are oiled from time to time, but are never unplaited or combed out (see page 250).

A SHEIK—AMERICAN AND ARAB MEANINGS

After leaving Siwa I put aside my khaki clothes and assumed desert garments, traveling as a Bedouin sheik. I find that in America *sheik* means something very terrible and fascinating; but 90 per cent of the sheiks in the desert are as little likely to run away with a beautiful woman as the same per cent of the sedate bankers of America! The word "sheik"



THE DOME OF THE MOSQUE AT JAGHBUB, UNDER WHICH IS THE TOMB OF THE GRAND SENUSSI

The university of the powerful Senussi sect is located at Jaghbub.

in Arabic means "an old man," and it has come in time to mean the oldest man of the tribe—that is, its chief, or the head of the religion, or the head of a caravan.

From Siwa my route lay to Jaghbub, the great educational center of the Senussi sect. Near here I encountered Sayed Idris El Senussi, head of the Senussi, who was on his way to Egypt. My long-standing friendship with this powerful leader was, in large measure, responsible for the success of this expedition, as well as for a previous one in 1921, since it was through his kind solicitude and the letters he gave me that I was able to overcome hostility at many a camp farther south.

Jaghbub is a small oasis, having no trade and no industry. Its existence depends solely upon the university. It has a mosque which can accommodate 500 or 600 persons, and within the enclosure is the great dome under which is buried the Grand Senussi, founder of the sect (see text, page 234).

It was necessary to stay in Jaghbub for five weeks, partly because of inability to

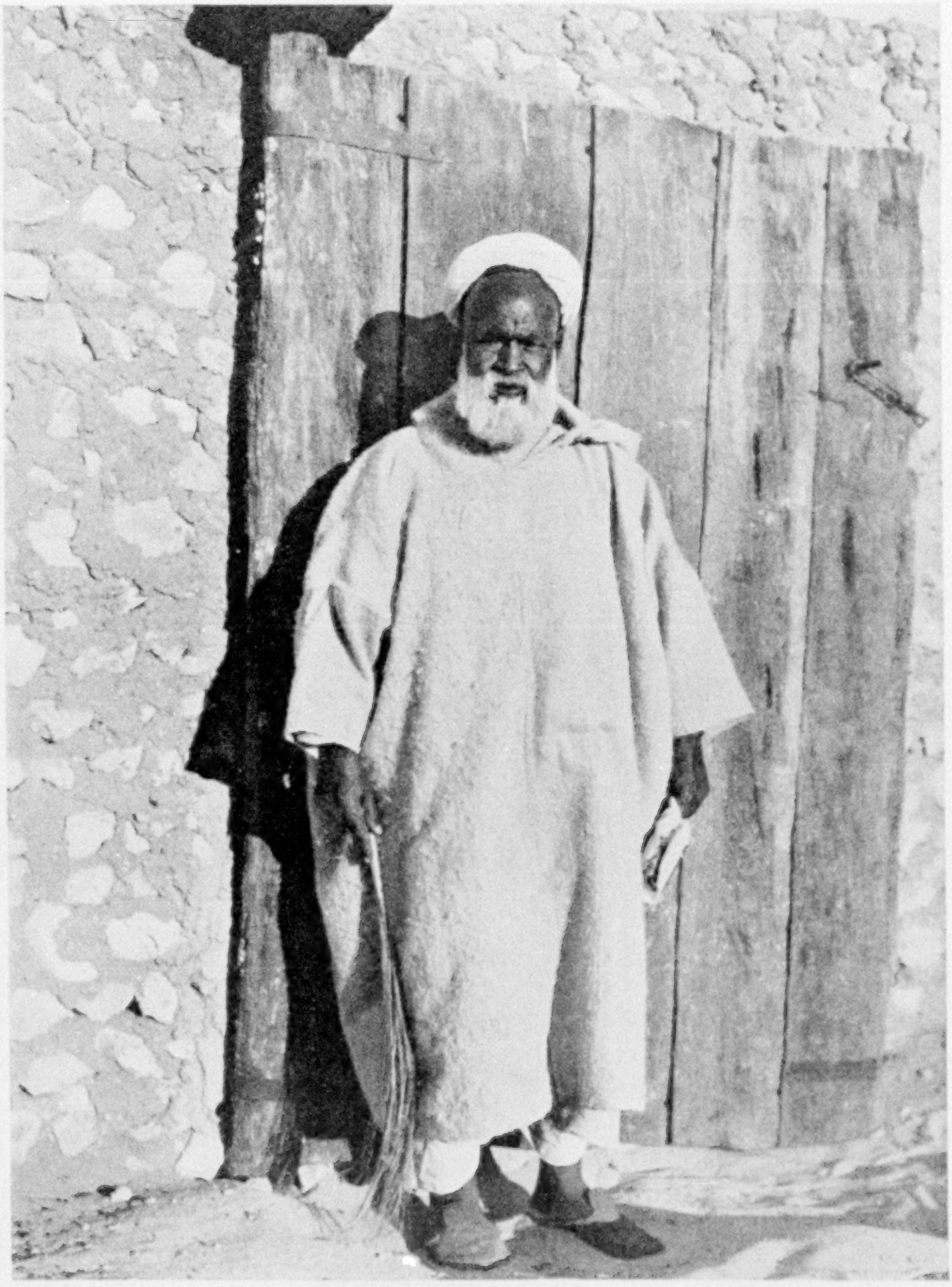
SIDI HUSSEIN WEKIL, A REPRESENTATIVE OF SAYED IDRIS, HEAD OF THE SENUSSI SECT AND A FRIEND OF THE AUTHOR

He is seated before a tea tray. The white rock at his right is a loaf of sugar, from which bits are broken off with a hammer, but if this implement is not at hand the tea drinker is apt to pick up the lump and bite off his share.

obtain camels and partly through the fear of men of other tribes to trespass on the route between Jaghbub and Jalo, the Zwaya and Majabra preserve. However, I eventually secured a Zwaya caravan going westward.

Two days' journey from Jaghbub, on the way to Jalo, we came across a petrified forest. The big bits of petrified trees are still used as landmarks on the way, set up according to an age-old practice of the desert.

It is customary when a caravan finds small pieces of stone lying about along the route to heap them up, to show that some one has passed. Of course, tracks in the sand are obliterated by the wind. It is a wonderful sight sometimes, when one has been trekking for five or six days without seeing any sign of the hand of man, to come across a pile of two or three stones on the ground. It straightway encourages one. The body of a camel or even the skeleton of an unfortunate



THE JUDGE AT JALO, WHO LIVED IN THE TIME OF THE GRAND SENUSSI

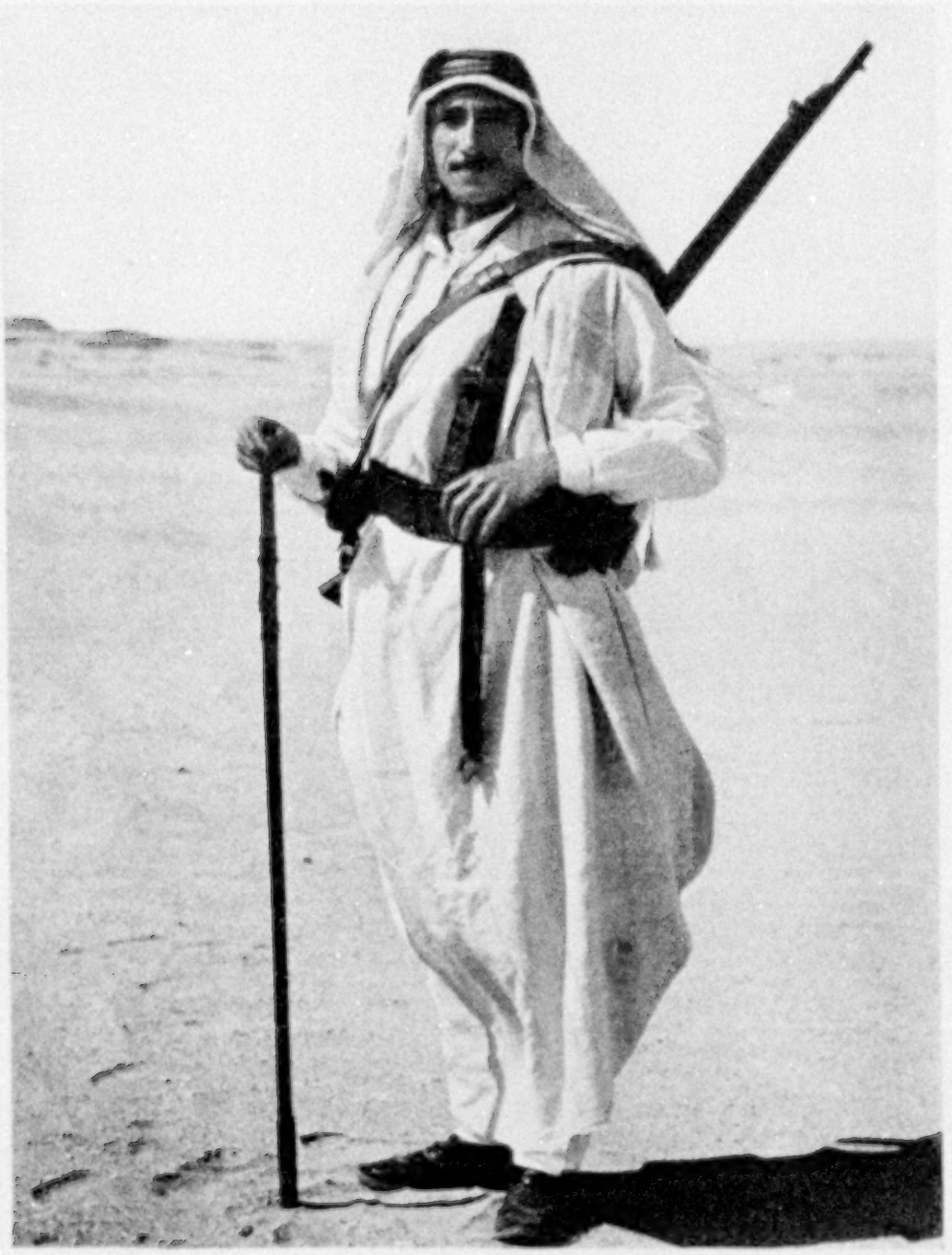
He was a very useful source of information to the author in collecting Senussi history. In his right hand is a fly swisher.

traveler, though an awful sight, at least shows that a caravan has passed that way.

IN A DESERT SAND-STORM

The most interesting feature of the trip to Jalo was eight days of sandstorm.

The desert is usually very calm, with an occasional breeze, which becomes stronger and stronger; then gradually the land looks as if it has been fitted with pipes emitting steam. The fine sand first rises, but as the velocity of the wind increases heavier grains rise. When the sand gets as high as one's head, it becomes distressing, and perhaps dangerous, if the traveler has to face it. Now he is obliged to go very slowly, and if he is not careful and vigilant he may miss the way. But if the wind is blowing from the right or left, it is not so difficult, because the sand can be warded off with the Bedouin clothes.



IN THE COSTUME OF THE DESERT

At Siwa the author put aside his khaki uniform and assumed the garb of a Bedouin sheik (see text, page 237).

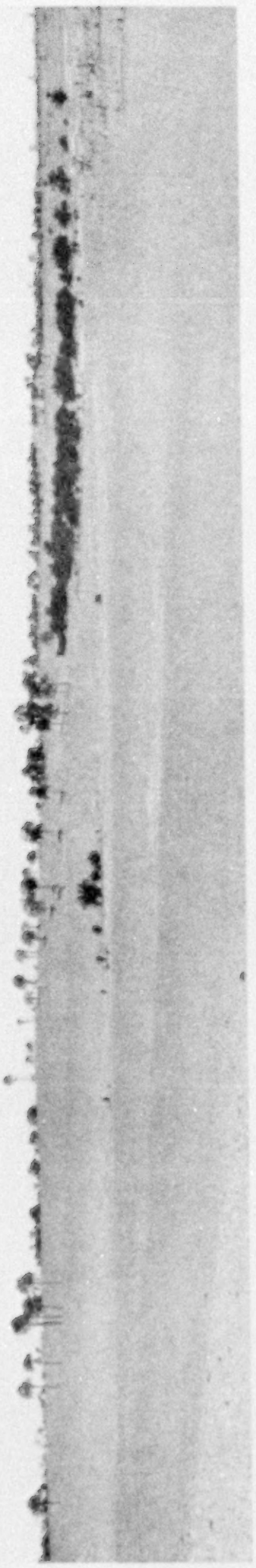
One day we had to advance in the teeth of the storm, and I saw how it could destroy a caravan. Of course, one has to keep moving slowly. To stop means to be drowned by the sand. The camels instinctively know this and continue to advance in spite of the tormenting blast. On the other hand, the moment the rain comes they stop or even kneel down.

During my previous travels I had collected many of the rules of sandstorms and their behavior, according to Bedouin information, but, to my great regret, they were all broken in those days of trial.

Sometimes, however, toward sunset, when we had been battling for hours against the seemingly interminable bombardment, the wind would stop dead, as if a master hand had given a signal. For an hour or more the fine sand and dust would settle slowly, like a falling mist. A short while afterward the moon would rise, and under the pale magic of its flooding light the desert would assume a new aspect. Had there been a sandstorm? Who could remember? Could this peaceful expanse of loveliness ever be cruel? Who could believe it?

A CARAVAN OF 15 MEN AND 37 CAMELS

At Jalo the preparations for the big march to the south were completed. My reorganized caravan consisted of 15 men and 37 camels.



THE OASIS OF JALO

This is an important trading center for caravans en route to Bengazi, on the Mediterrancan coast, from French Equatorial Africa. It has many wells and date palms, sustaining a population of 2,000.

The arms for the trip were a motley assortment — 9 rifles, 4 revolvers, and 3,000 rounds of ammunition. Three of the rifles were old Egyptian army weapons. The others were Italian, Russian, and German guns smuggled into the Senussi country by the German submarine gun runners during the World War, and used in the Senussi attacks upon the western frontiers of Egypt under the leadership of Sayed Ahmed, cousin of Sayed Idris, who was under the influence of Turkish and German officers.

During the desert journey these guns were seldom used except upon our approach to a Bedouin settlement in an oasis, on which occasions I ordered each man of the caravan to fire three rounds, ostensibly as a salute, but in reality to impress the possibly hostile natives with our armed strength. Sometimes, also, gazelles and other game were shot to provide meat for my men.

Most of the members of the caravan remained with me throughout the journey, going back to Cairo, and, as a tribute to their loyalty and indefatigability, I can only say that, in the event I should ever attempt to repeat the journey, I could wish no better fortune than to have every man of them in the party.

JALO CENTER FOR NORTHBOUND TRADE IN FEATHERS AND IVORY

Jalo is one of the most important oases in Cyrenaica, partly because of the dates which it produces, but more especially because it is the destination of the caravans coming north from Kufra. Ivory and ostrich feathers from Wadai and Darfur come to Jalo to be forwarded either eastward to Egypt or northward to Bengazi. This trade is chiefly in the hands of the Majabra tribe, whose head men are the merchant princes of the Libyan Desert. A Majbari (singular of Majabra) boasts that his father died on the *basur* (camel's saddle) in the same way that a soldier boasts that his father died on the field of battle.

From this oasis we moved southward to Buttafal well, a day's journey from Jalo, where water was obtained for the trek across desolate sand flats to the wells of Zieghen.

Before setting forth the details of the

XUM

EL HARASH WELL, IN THE ZIEGHEN DISTRICT

This is the first water in the desert after leaving Buttafal (see text, page 247). Two men are filling *girbas* (sheepskins) with water. In the foreground is Bibo, the expedition mascot (see text, page 245).

DATE PALMS IN THE VALLEY OF KUFRA

In the middle distance the light streak is the Lake of Kufra (see also illustration, page 246). In the foreground are the dwellings of the natives.

ZWAYA CHIEFS OF KUFRA

The Zwaya are the conquerors of Kufra and the inhabitants of it now. They are the tribesmen who destroyed all the notes and scientific results of the German explorer Rohlfs when he visited them in 1879 (see text, page 236).

long journey, it may be well to describe the organization of the caravan.

In addition to our 15 men and 37 camels, an important member of the expedition was Baraka, my chestnut Arabian horse, which made the entire journey and endured the hardships astonishingly well. Day after day, in midsummer, he stood tethered near my tent, in the broiling sun, with the temperature sometimes registering 113° F. He is in Cairo now enjoying for life a well-earned rest.

THE MASCOT OF THE CARAVAN

The mascot of the caravan was Bibo, an unimpressive-looking nondescript dog. He was one of the marvels of the expedition. There were days when he must have traveled 60 or 75 miles while we were covering 25 or 30, for he had an insane propensity for chasing birds over the desert.

His vitality was amazing, but he also had a certain canny instinct, for when weary he plainly indicated the fact and appealed, in a manner almost akin to speech, to one of the boys, who would lift him aboard a camel. Here he would perch upon a sheepskin water bag, the coolest spot in the desert. As the day progressed, he would move around to the water bag slung on the other side; so that, like the Kentucky colonel of whom I have heard, who with his mint-julep glass "followed the shade around the house," Bibo followed his around the hump.

Our shelter equipment consisted of four tents — three bell tents and one A tent. The last frequently was not erected, as it required considerable effort. The bell tents, with their sides raised to admit air, furnished quasi-shelter from the sun, and beneath one of these I usually rotated around the central pole, keeping always just beyond the sunlight, so that my body formed a sort of sundial, as it progressed in circular fashion.

Four cameras and a motion-picture outfit were carried as part of the expedition's equipment, together with an enormous supply of films.

It is the experience of most explorers in tropical regions that, in order to preserve one's films, they must be developed within a few hours of their exposure; but, with very few exceptions, mine were not developed until after I had returned to civilization—that is to say, after exposure they were kept in tin containers for from one to eight months.

The chance of losing the pictures had to be taken because of the impurity of the water along the route; in fact, from the time we left Sollum until our arrival in El Obeid, we had not one glass of clear water for drinking purposes. In cases where we were using new sheepskin water bags, the water absorbed the tar with which the bags were lined, and where we used old containers the liquid invariably carried in suspension particles of the hair of the hide, as well as other impurities.

On the long treks between water wells, our water camels each carried four sheepskins with an aggregate capacity of 24 gallons.

There is considerable misconception as to the amount of water required by the desert traveler. In winter we found it possible to subsist on an ordinary glassful in the morning and another in the evening. Occasionally, on the daylight marches, a third glass was taken at midday, but this was looked upon as more or less of an effeminate weakness. When it became hot we tried to save water by resting during the day and trekking by night (see text, page 273).

My horse required a third of a sheepskin of water daily, or half a sheepskin every other day, when the supply was scant.

TEA AND RICE ARE STAND-BYS IN THE DESERT

Our food consisted chiefly of rice, flour, dates, and Bedouin butter, the latter almost invariably in liquid form, made from sheep's milk and usually rancid because of its containers—old hide bags.

The stand-by of the desert traveler, however, is tea—not the emasculated and emaciated beverage of civilization, but a potent black brew made from one handful of tea and sugar in equal proportions, placed in a small pot having a capacity of perhaps a pint of water. This is boiled and the bitter-sweet liquid is served in tiny glasses holding about two ounces.

Two glasses of this drink will imbue the user with remarkable vitality. He

THE SALT-WATER LAKE OF KUFRA

This attractive body of water, with an area of two square miles, is very deep in the center. The oasis surrounds the lake. In the foreground is one of the notable Bedouin chiefs of Kufra and one of the Senussi soldiers. When the author asked this chief if there were fish in the lake, he replied: "What is a fish? Does it walk? Does it fly?" It was found to be almost impossible to describe a fish to a person who had never seen one.

becomes wakeful, watchful, and eager for the journey. The effect is exhilarating without being intoxicating. This desert tea is an acquired taste; but once the Bedouin beverage habit is formed, it is very difficult to go back to the pallid tea of civilization.

The staff of life in desert travel is not bread, but rice, which is boiled afresh at each halt. Bread is made without leaven, and is a heavy, unpalatable food, eaten chiefly during the day's march.

LEADER AND MEN MUST FARE ALIKE

I have been asked why biscuits (crackers) were not included as supplies for desert travel. The answer is that an entire caravan devoted to their transport would hardly supply the voracity of one Bedouin's appetite. I am confident that any of my entourage could have consumed a cubic foot of biscuits in the course of a day's march. The Bedouin can travel long and far on a limited amount of food, but when plenty is at hand his powers of consumption are phenomenal.

No leader of a caravan need expect to carry dainties for himself and maintain the morale of his men; for, once in the desert, master and man are on the same plane, and each must share with the other all that he has.

When an oasis is reached, a feast may be tendered to the leader by the sheik, or head man, and less pretentious entertainment provided for the men of the caravan. No resentment is felt at such discrimination; but out in the sands each must subsist as every other man in the caravan and do his share of the day's work, without regard to rank.

As a matter of fact, a greater tax was placed upon my endurance than upon that of any other member of the organization; for, in addition to the work of inspecting each camel load and taking a hand at breaking and establishing camp, when all others were through for the day or the night, as the case might be, it was

then my responsibility to enter the scientific data in my diary, wind and compare the six watches which I carried (four of which, unfortunately, went out of commission before the end of the journey), label and store the geological specimens collected, and record the films used.

The theodolite was one of my chief cares on the journey, for the Bedouins are extremely suspicious of this instrument. They had had sufficient experience with European nations to deduce the fact that where surveys of their country had been made armed forces generally followed for purposes of conquest. It therefore became necessary for me to practice pardonable deception in order to utilize the instrument.

Readings were taken principally late in the afternoon, and I always made my observations at some distance from native settlements, explaining to the inquisitive Bedouins that the theodolite was in reality a camera, which could be taken out of its box in the twilight or dawn. I had to explain that the camera and the theodolite worked alike, *attracting* pictures to them.

"How could a camera attract a picture far away from it?" asked a Bedouin of the Nubian head man of my caravan, who was very good at concocting harmless inaccuracies. Abdallah threw his hands in the air: "Ask the magnet how he attracts the iron!" was the simple and, to the Bedouin, convincing reply.

SAYED MOHAMMED EL ABED, COUSIN OF THE HEAD OF THE SENUSSI SECT AND THE RULER OF KUFRA

He proved very kind, helpful, and hospitable to the expedition (see text, page 251).

HELPING BIRDS ON THEIR NORTHWARD FLIGHT

It is a trek of nine days from Buttafal well to Zieghen, across one of the most desolate parts of the world. Birds migrating northward to Europe, some of them small robins, fly 250 miles without a drink of water. Sometimes these intrepid travelers, apparently mistaking us for trees, would alight upon our heads or shoulders (see illustration, page 254). We would give them a drink, and off they would fly again. They never made a mistake and started south. As we went along we saw remnants of wings which told their own story.

During this stage of the journey I used to ask the guide in the morning to indicate the line of march for the day. He would trail a line with his stick. I would

SAYED MOHAMMED EL ABED'S NEPHEW WITH HIS TUTOR, A SENUSSI "IKHWAN" (LEARNED MAN)

The *ikhwans*, in addition to their responsibilities as teachers, play the rôle of peacemakers among the Senussi when a murder is committed. It is they who act as intermediaries in settling the question of blood money (see text, pages 251 and 252).

TUAREGS IN KUFRA

The men of this tribe, rather than the women, conceal their faces, and even when they eat do not remove their veils. This feat in feeding is accomplished by the use of specially constructed spoons. For an account of this interesting Saharan Berber people, see "Timbuktu, in the Sands of the Sahara," by Captain Cecil D. Priest, in THE GEOGRAPHIC for January, 1924.

take bearings on it and check him ten or fifteen times in an hour with my compass, and he would not waver a yard, walking half a mile ahead of the caravan. It was extraordinary to watch him, to see that beautiful straight line.

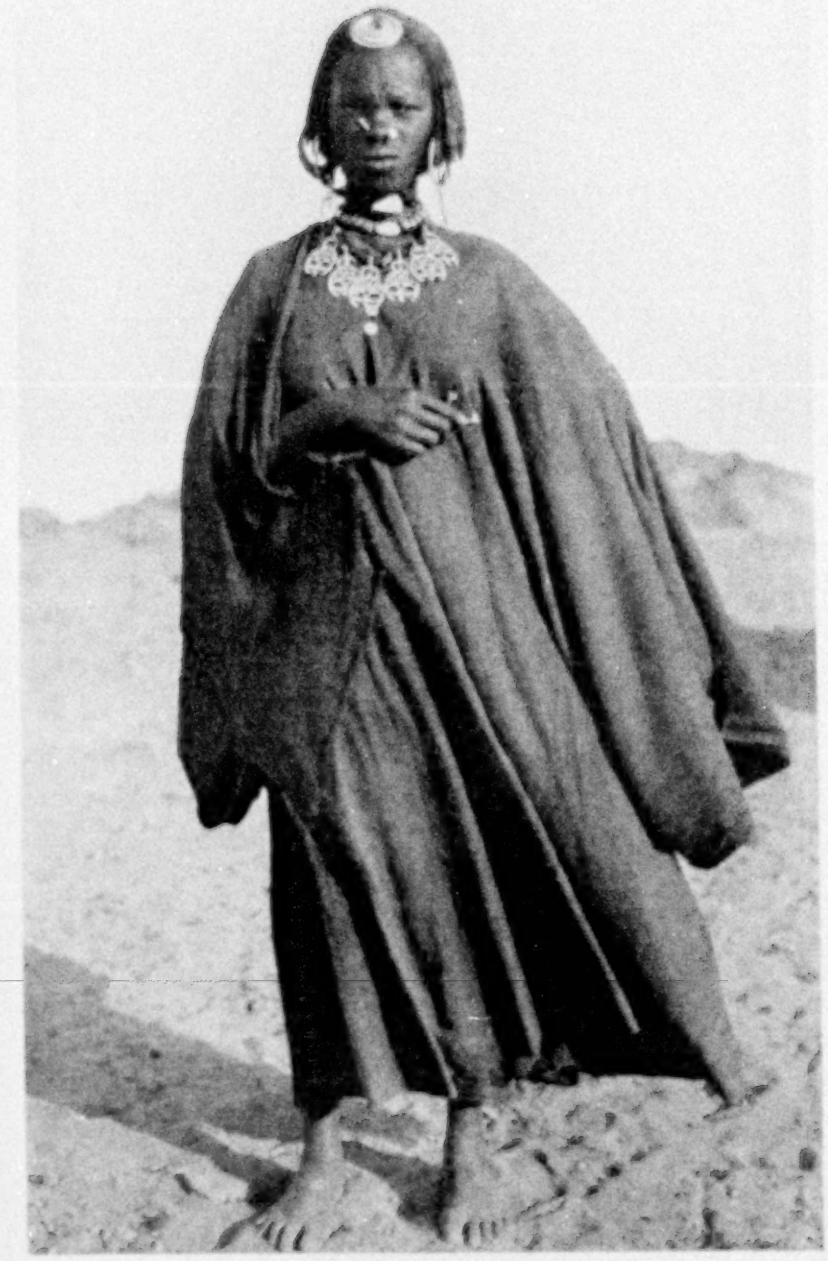
In daylight trekking, the Bedouin uses his shadow for a compass, and so experienced has he become that his course alters imperceptibly as his shadow moves in sundial fashion.

About midday he would get in trouble, because traveling by his shadow, this would then be between his feet!

I caught him at the end of one day in just one mistake. The stars had not come out, and he was going absolutely due west when he should have been going south. If I asked him in the daytime, "Are we going in the right direction?" he would wave his hand and say, "God knows best!" Of course, "God knows best," said with an air of assurance, is all right, but if a Bedouin guide tells you "God knows best" in a hazy way, after you have seen him wobble, it means he has gone astray.

We lost three camels on this stretch of desert.

Arriving at Zieghen, I was able to correct its location on the map. Rohlfs, the German explorer, who went before me 45



A TEBU GIRL

The Bedouin style of her apparel and the jewelry which she wears show the influence of Arab civilization on the blacks of the desert. In her ears are silver earrings, her necklace is of amber, and in her nose are bits of amber and coral.

years ago, had located it 62 miles from where it really is. This was not his fault. He put it down from hearsay, for he had never been there. I suspected the error when I visited the oasis in 1921, but could not be sure until I had accurate instruments.

A TRAGEDY NEAR ZIEGHEN

Near Zieghen there have been tragedies, because if the traveler happens to go a little to the right or the left he will miss the well and find no water, for here, as in some other places in the desert, the well is not walled in with masonry, but is merely a water hole. Often only a patch of damp sand indicates the presence of water, and the guide will dig a little and find the well (see illustration, page 243).

Three days from Zieghen there is an old landmark called Garet El Fadeel. In the desert, whenever anything is named for a man it means a bit of tragedy. This man, El Fadeel, was one of the finest guides between Jalo and Kufra. On his final journey he was leading his caravan when a little sandstorm arose. He had trouble with his eyes, so asked a companion to describe all the landmarks. They mistook one, went to the west instead of to the east, and missed their well.

They realized their mistake too late. They tried to go to Kufra, but fell exhausted on the way.

One camel escaped and finally reached Kufra, where it had been accustomed to graze. When it arrived the natives saw a mark on its neck and knew it was El Fadeel's camel. A search was begun for the party, but it was of no avail. The men had died of thirst.

Curiously enough, fifteen years later this party's luggage was found untouched, preserved by the sand.

THE ARRIVAL AT KUFRA

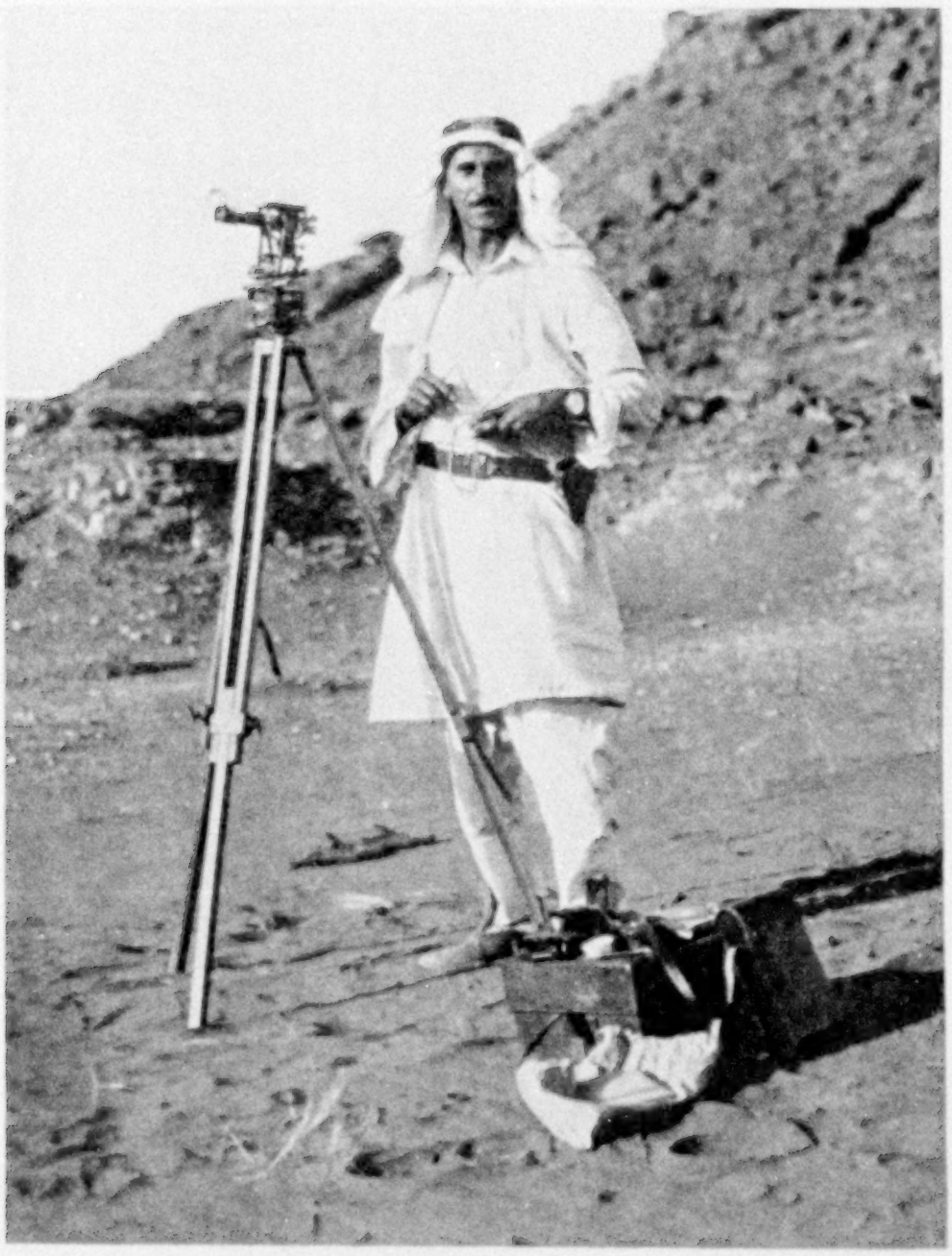
On the march from Zieghen to Kufra I encountered the most awful sandstorm of my experience. About midnight my tent began to be shaken by the wind, so I got out and tightened the rope. At 2 o'clock the tent collapsed on me, the pole hitting and smashing the smaller of my two remaining chronometers. If it had struck my big chronometer I should not have been able to bring back my scientific results—a matter of pure luck!

I reached Kufra on April 1, 18 days after leaving Jalo.

The most attractive feature of this oasis is a beautiful lake having an area of some two square miles (see page 246), in which I was admonished not to bathe, as "only children do that."

I had letters for Sayed Mohammed El Abed, the cousin of Sayed Idris El Senussi (see text, page 238). He was very helpful and most hospitable. As a matter of fact, of all the dangers I encountered at Kufra, his hospitality was, I think, one of the greatest! He had to produce about 15 courses for late breakfasts and dinners, and I exhausted all my sodium bicarbonate and indigestion tablets. On one occasion, just after partaking of his bountiful hospitality, I was entertained at dinner successively, the same day, by three Senussi chiefs. Etiquette forbade my declining any of the invitations.

When they dislike a traveler the Bedouins have a very clever way of dealing with him without assuming the blame for "mishaps." They treat the visitor royally and then wait for him outside the village or oasis and attack his caravan; if they can destroy it, they do so. Then there are many excuses. If they are questioned they say, "We showed him every hospitality while he was in our midst; outside there are many robbers. One cannot know who committed this crime."



WITH THE THEODOLITE IN THE DESERT

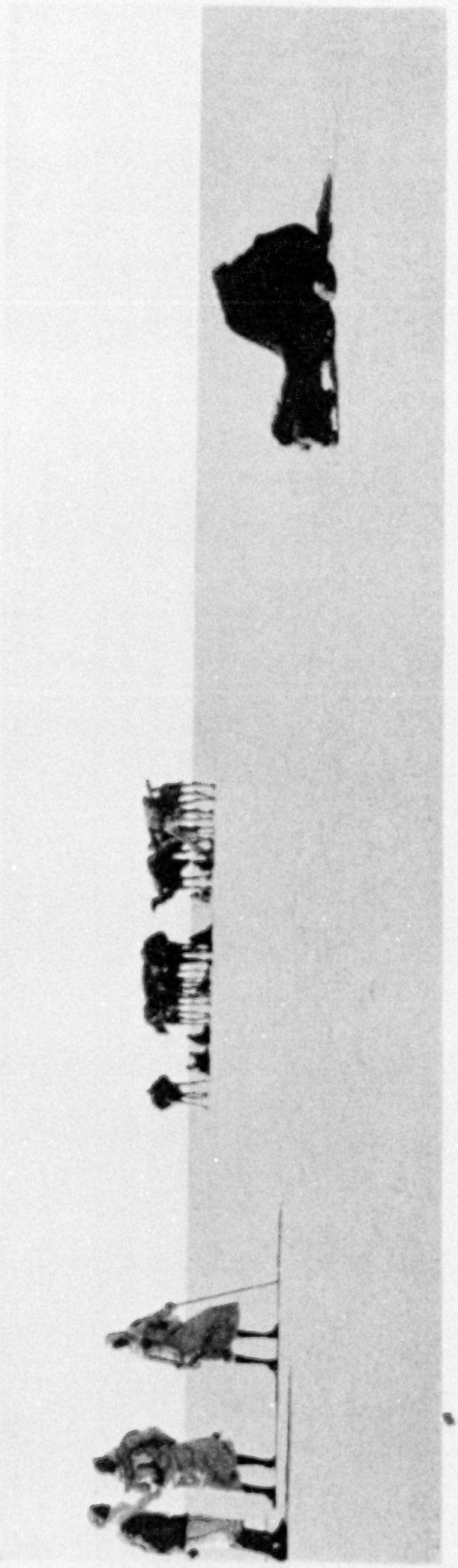
The Bedouins were extremely suspicious of this surveyor's instrument. They were told it was a type of camera which *attracted* pictures from a distance (see text, page 247).

THE BEDOUINS ARE CHIVALROUS AND ROMANTIC

Among the Bedouins of Kufra, as in other oases of northern Africa, one sees only old women or very young girls. The newly married women are generally in the house, because that is the woman's place in the desert.

The Bedouins lead very chivalrous and romantic lives. When a young man wishes to marry he goes to his sweetheart's camp and sings to her, in many cases his own verses. If the girl likes him, she sings to him in verse tune. Then, if the girl's family approves, there is a marriage.

But occasionally there are elopements, and sometimes vendettas have begun thus. If, in the feud, one man kills another, the family of the deceased generally goes to an *ikhwan,* a learned man of the Senussi sect. The ikhwan takes the murderer and goes to the camp of the dead man's tribe and says to his relatives: "This is the man who killed your



A VICTIM OF THE DESERT: ONE OF THE CAMELS LOST ON THE TREK FROM KUFRA TO ARKENU (SEE TEXT, PAGE 270)

relative. You have him here. You can do what you like with him."

Usually the reply is, "May God forgive him, we know it." The blood-money question is then agreed upon—generally $3,000, or possibly $2,000 cash and the remainder in camels and slaves. Nearly always blood money is accepted. Sometimes, however, when the feud is strong, this is refused. In such cases the murderer is sure to be slain. He may be allowed to live five, or ten, or fifteen years, but he is bound to be killed, or, if not, then the highest man in his tribe is slain.

The black Bedouins of the south are more reasonable. If a man has killed another, he pays blood money, or he is killed by the slain man's family. But once the murderer dies, no other member of the clan is involved.

The Bedouins marry more than one wife if they can afford it, and in many cases the wives live on good terms with each other. But the eldest, or first, wife remains the mistress of the house. Once, while visiting an old man in Kufra, I was startled, as we entered the courtyard, to hear my companion address one of these wives as "You gray-haired woman!"

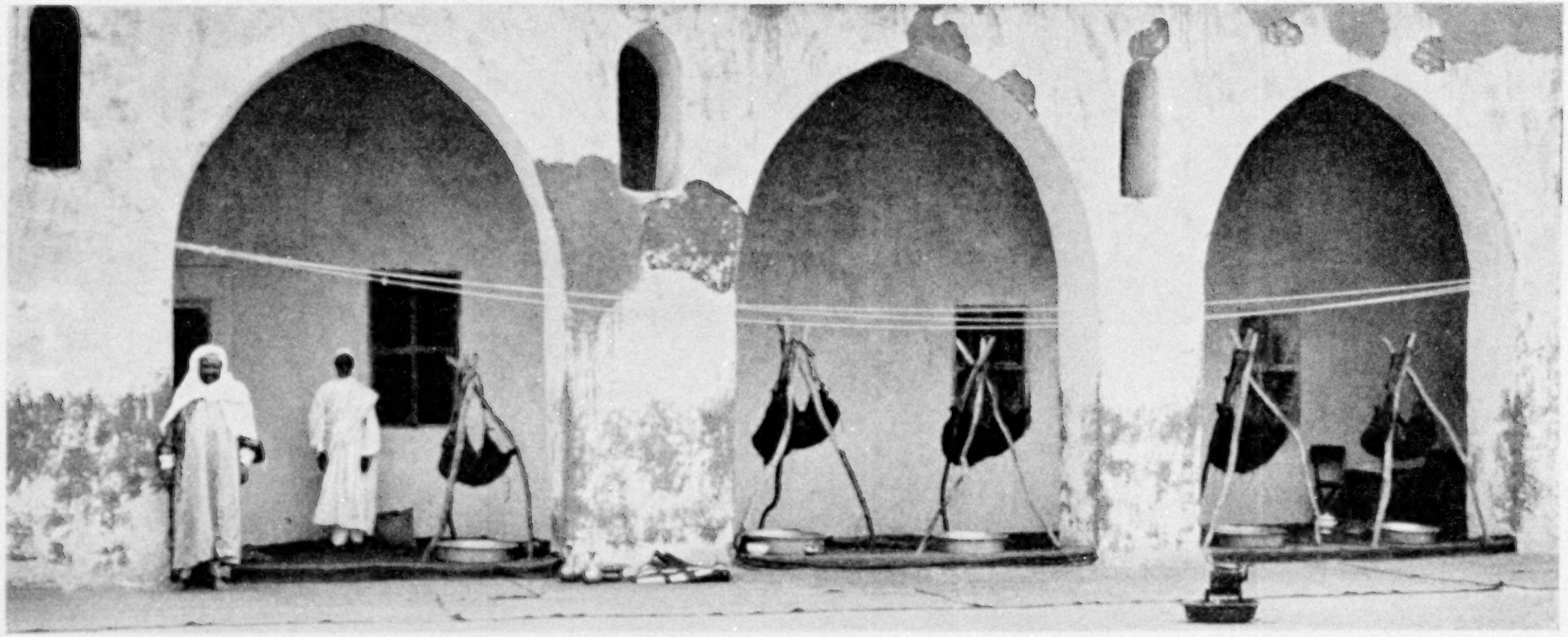
"Hush! Don't call her 'gray-haired woman'!" I cautioned. But he assured me that it pleased her, and he was right. She welcomed us, and I found that with these people reference to one's age is a mark of respect.

MEN SLAVES AT HALF PRICE

The Bedouins still buy and sell slaves, but the trade is inconsiderable nowadays. When I was in Cyrenaica on my first visit, in 1916, I was offered a slave girl for $24; now the girl costs $150. Men are cheaper—about half price!

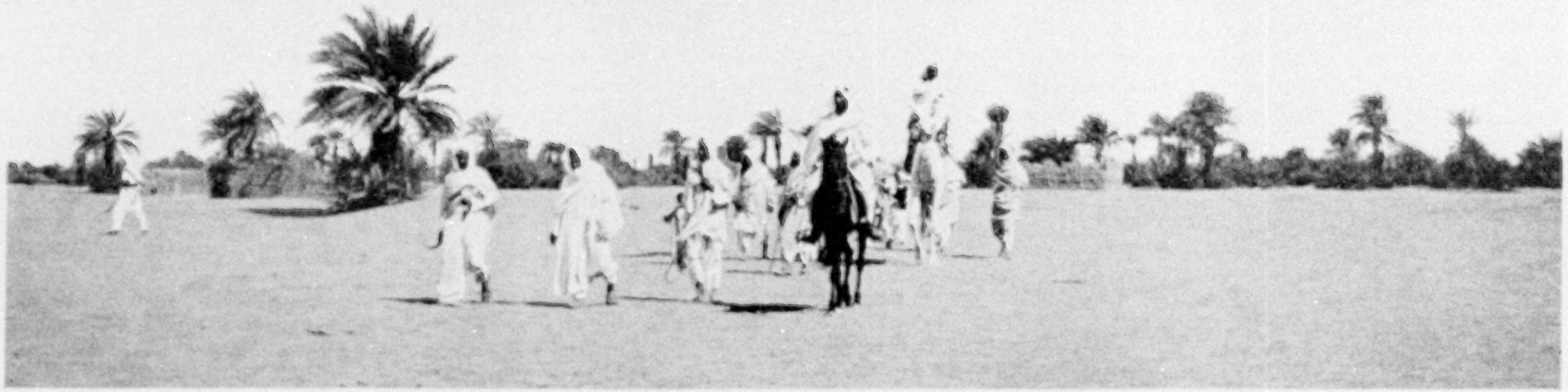
Only by the use of the letters from Sayed Idris was I permitted to remain in Kufra sufficiently long to rest my men and animals. Despite the intrigues of a faction of Bedouins who were ill-disposed toward me, the stay in this fertile oasis was full of interest. It had been visited previously by only three travelers from the outside world—the German explorer Rohlfs in 1879, and Mrs. McGrath (Rosita Forbes) and myself in 1921.

It was during our short halt at Kufra that I learned for the first time of the



SAYED MOHAMMED EL ABED'S HOUSE IN KUFRA

Hanging from the tripods are sheepskins of water left to cool in the shade, and beneath them are shallow copper pans. In the foreground is a teapot.



LEAVING KUFRA FOR THE TREK INTO THE UNKNOWN

The route from this point to Erdi, by way of Arkenu and Ouenat, had never before been traversed by one from the outside world.

BEFRIENDING A ROBIN THAT HAD FALLEN EXHAUSTED ON ITS WAY FROM EQUATORIAL AFRICA TO EUROPE TO SPEND THE SUMMER

The walking stick, with a brass ferule and an ivory knob, was mistaken by some of the blacks for a gun. In his right hand the author is holding a glass of water from which the bird has just drunk (see text, page 247).

recent arrival of a French military, reconnaissance party at Sara well,* which lay on my proposed line of march to Wadai by the beaten trade route.

With the Sara district now among the explored places of the desert, there was only a short strip of untraversed territory lying between it and Kufra.

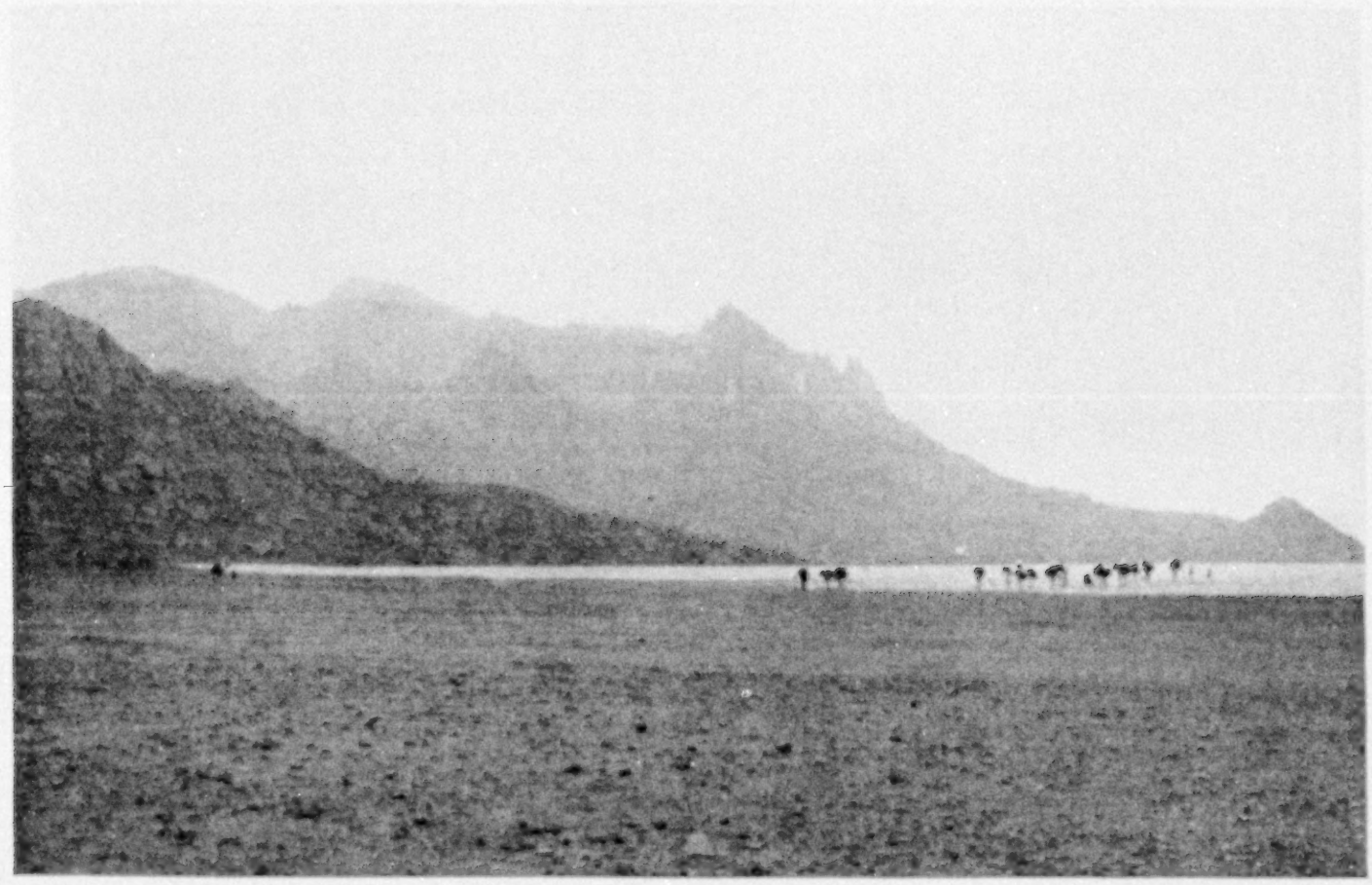
I thereupon determined to cut across from Kufra by an unfrequented route which might lead to the lost oases of Arkenu and Ouenat. There had long been a tradition that these oases existed in or near the southwest corner of Egypt. On a map published by Justus Perthes, of Gotha, in 1892, a small unnamed oasis and well were indicated in latitude 21° 51′ and longitude 23° 3′, and another uninhabited oasis, also unnamed, about thirty miles due east.

It is presumed that both these oases had been placed on the map as the result of vague Arab statements; for, according to all available records, they had never been visited by an explorer. Indeed, their very existence was so doubtful that they had not been shown on the maps either of the English or of the French General Staff.

In Mr. W. J. Harding King's paper of 1913, on "The Libyan Desert from Native Information," there is a statement to the effect that he had heard of a place called Owana, or Owanat, halfway along a road from Merga to Kufra, where there was a well and green grass after rain. Mr. King placed the oasis at a distance of more than 80 miles from the nearer of the two oases shown on the German map.

If these oases could be found, I knew that they would prove of

* This apparently was the small party headed by Bruneau de Laborie, which had come from the Gulf of Guinea by way of Lake Chad. From Sara well de Laborie subsequently reached Kufra and thence proceeded, by way of Jalo, to Siwa.—EDITOR.



THE CARAVAN APPROACHING ARKENU EARLY IN THE MORNING

Sunlight piercing a gap in the mountain wall throws a white streak across the sands resembling water.

exceptional value to my country, for they would provide a possible new route of desert travel from Egypt into regions of the Libyan Desert which are still unexplored.

THE START FOR THE UNKNOWN

Having decided upon this new objective, I encountered great difficulty in persuading the man from whom I had hired the camels to let me have my way. The hostile faction at Kufra, however, was anxious to have us take this route because the last caravan of Bedouins to make the journey, eight years previously, had been massacred when just within the boundary of Darfur. If the same fate should overtake us, as seemed to these inimical ones altogether likely, the dwellers in Kufra would be spared the pleasure of a third visit from their unwelcome guest!

After leaving Kufra, the chief adventure of the expedition began. Here at last I was plunging into the untraversed and the unknown.

What lay ahead?

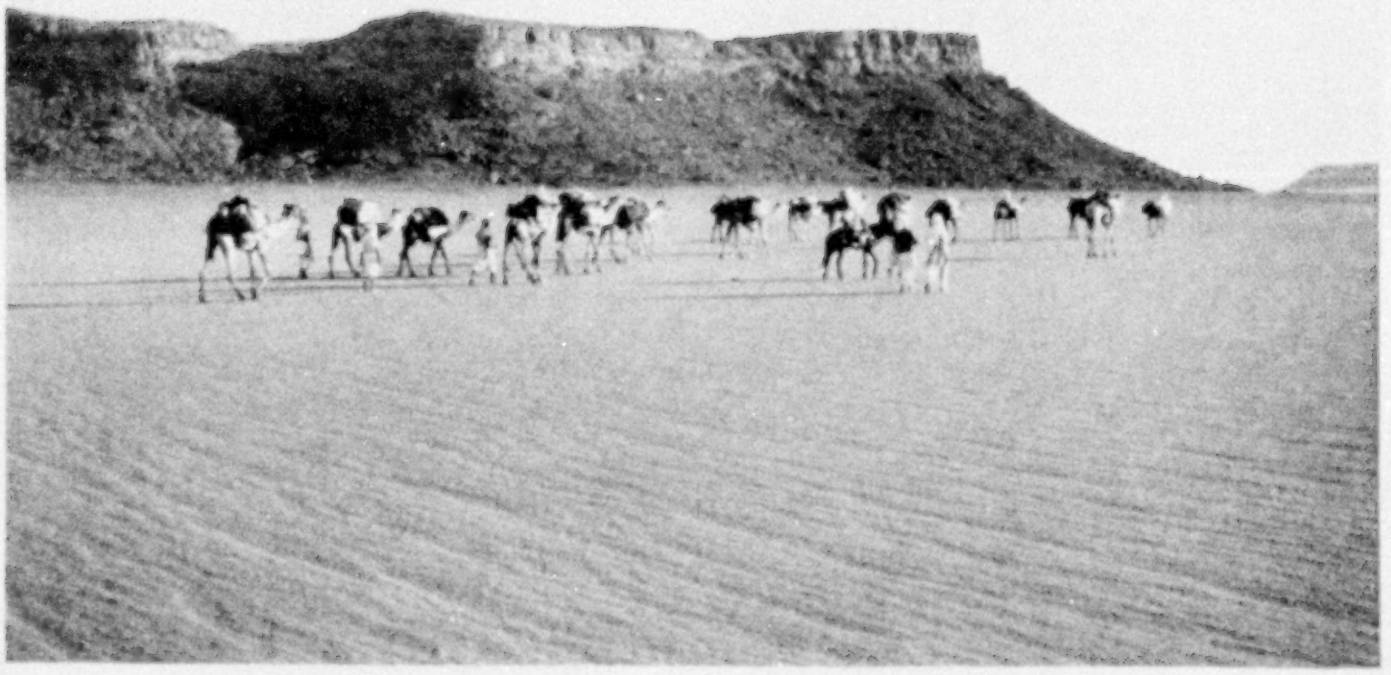
It was not the possible dangers of the journey which made my nerves tingle and caused my spirits to mount with exhilaration—dangers are merely a part of the day's work in the desert. It was the realization that I was to explore hidden places; that I should go through a region hitherto untrodden by one of my own kind, and make, perhaps, some contribution, small though it might be, to the sum of human knowledge.

Sayed el Abed sent three representatives to see us off at 4:30 in the afternoon of April 18. Our caravan was still making daylight treks, though the unbearable heat of early summer was soon to end these.

THE BOND BETWEEN CAMEL-DRIVER AND CAMEL

The camel-driver on march is an interesting subject of study. There is between him and his beast of burden a bond of affection hardly less strong than that which exists between the Arab horseman and his steed. The camel is the essential of life in the sands. Travel and trade are dependent upon him.

On march the camel goes best when his driver sings. These songs, or chants,

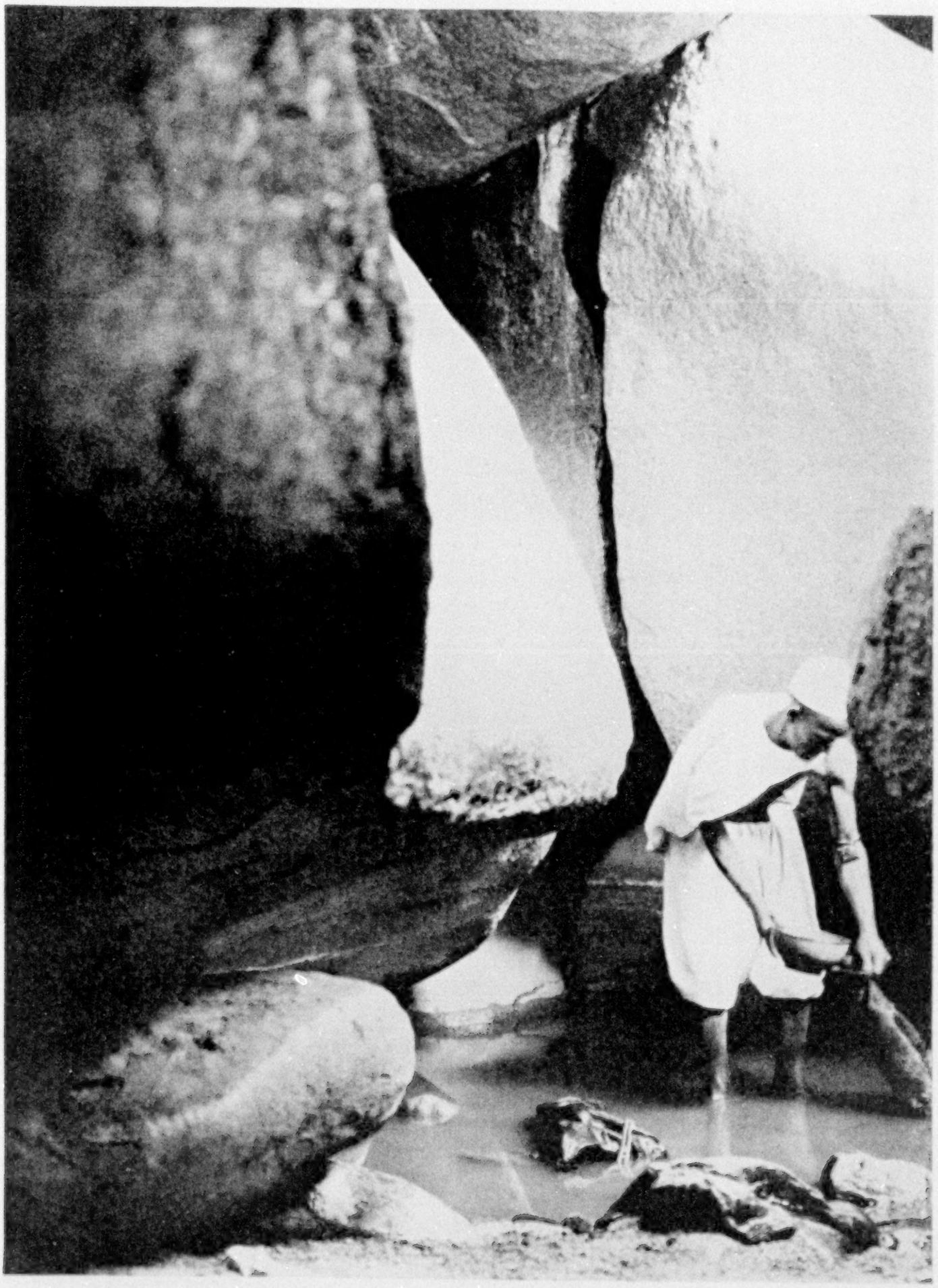


APPROACHING THE HILLS OF OUENAT

Ouenat was found to be an oasis with 150 part-of-the-year inhabitants (see text, page 275).

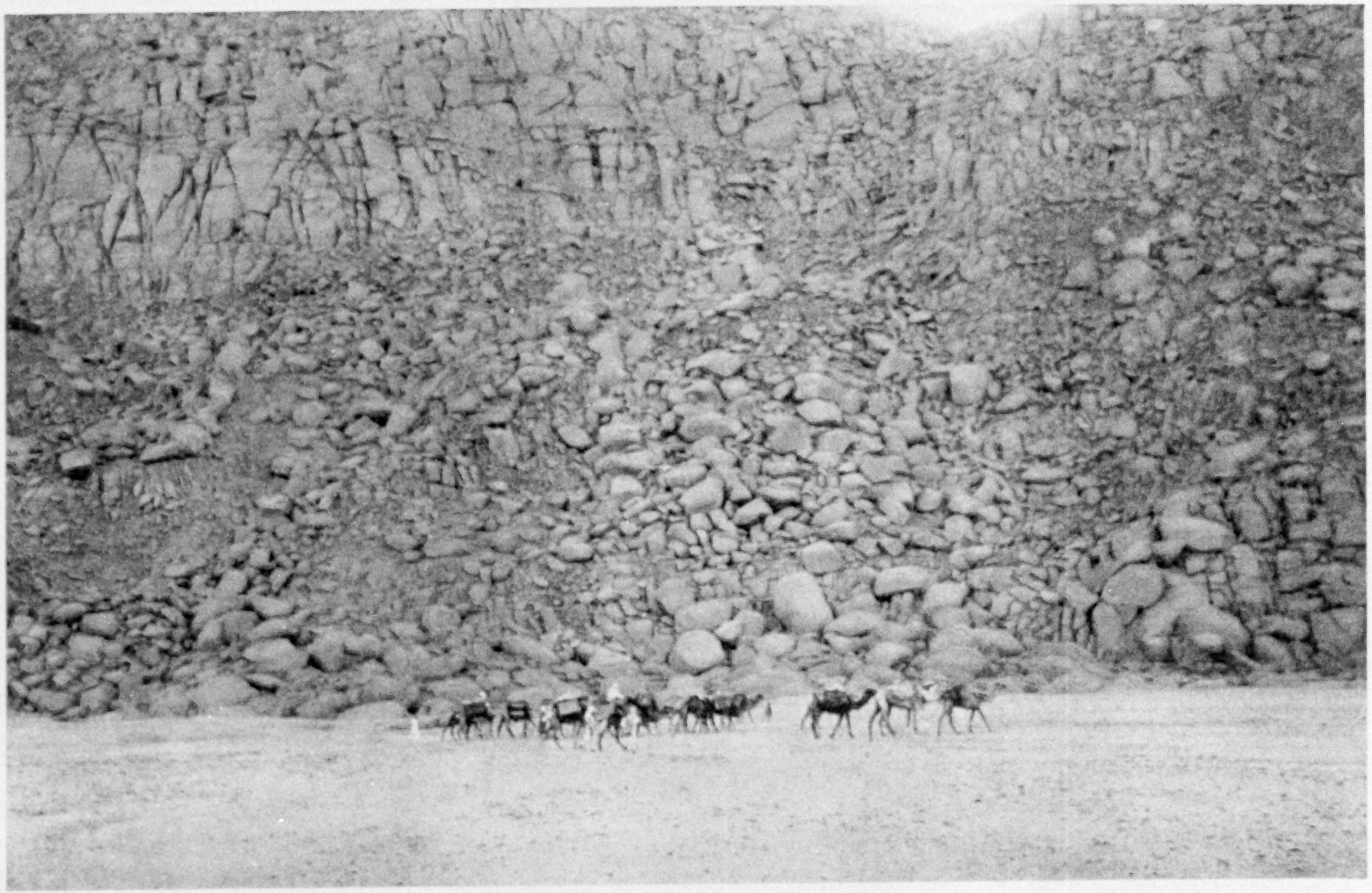
THE DESERT AS SEEN FROM THE HILLS OF OUENAT

The white spot is the author's tent, which was not often set up, as it was very difficult to raise (see text, page 245).



ONE OF THE WELLS AT OUENAT

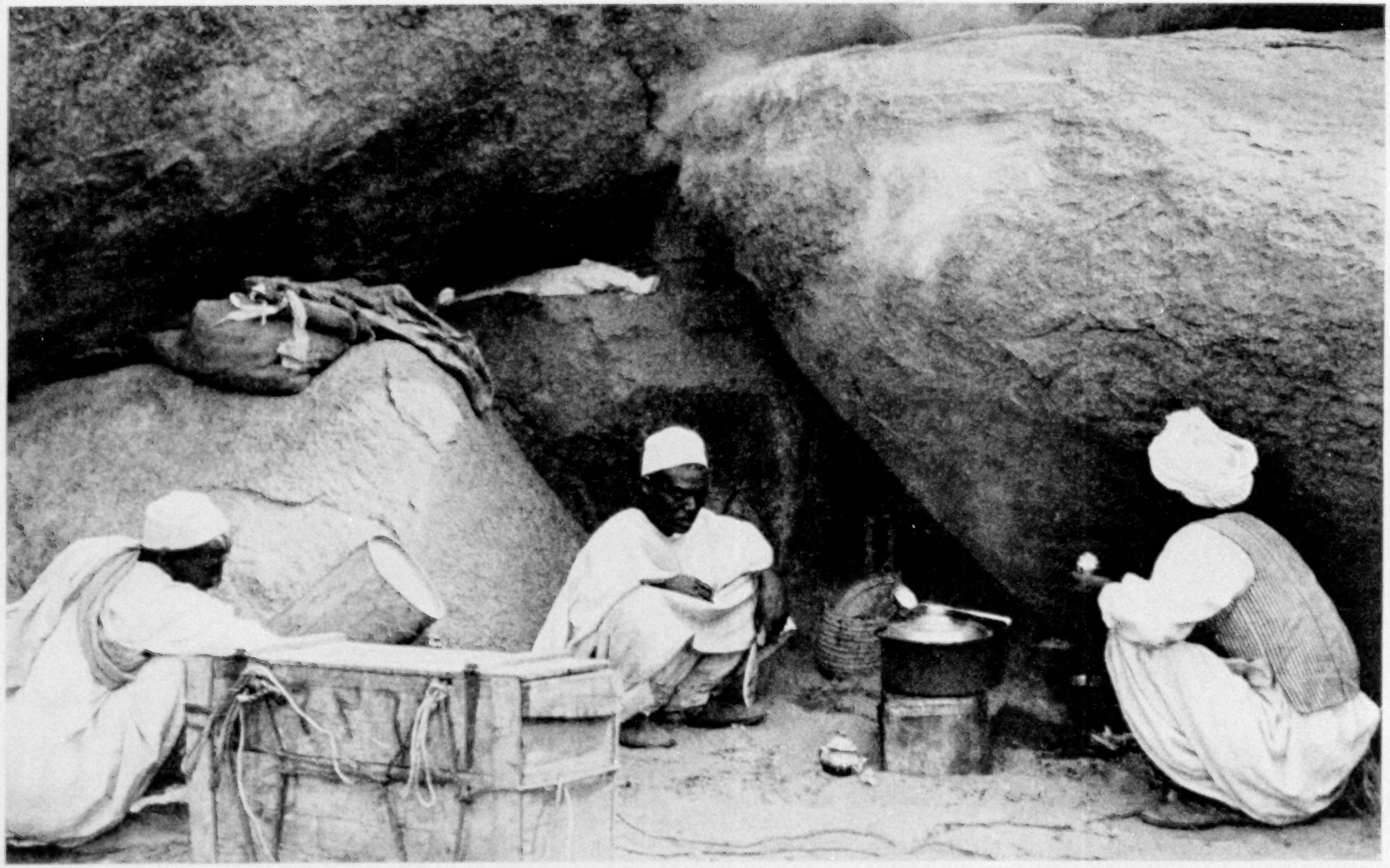
There are two types of wells known to the desert—the *ain*, which is a natural spring, and the *bir*, whose existence is usually indicated to the traveler by damp sand, where he may dig and find water. These natural basins of Ouenat, which contain rain water, are not, strictly speaking, of either type, but they are called ains.



THE CARAVAN APPROACHING THE OASIS OF OUENAT

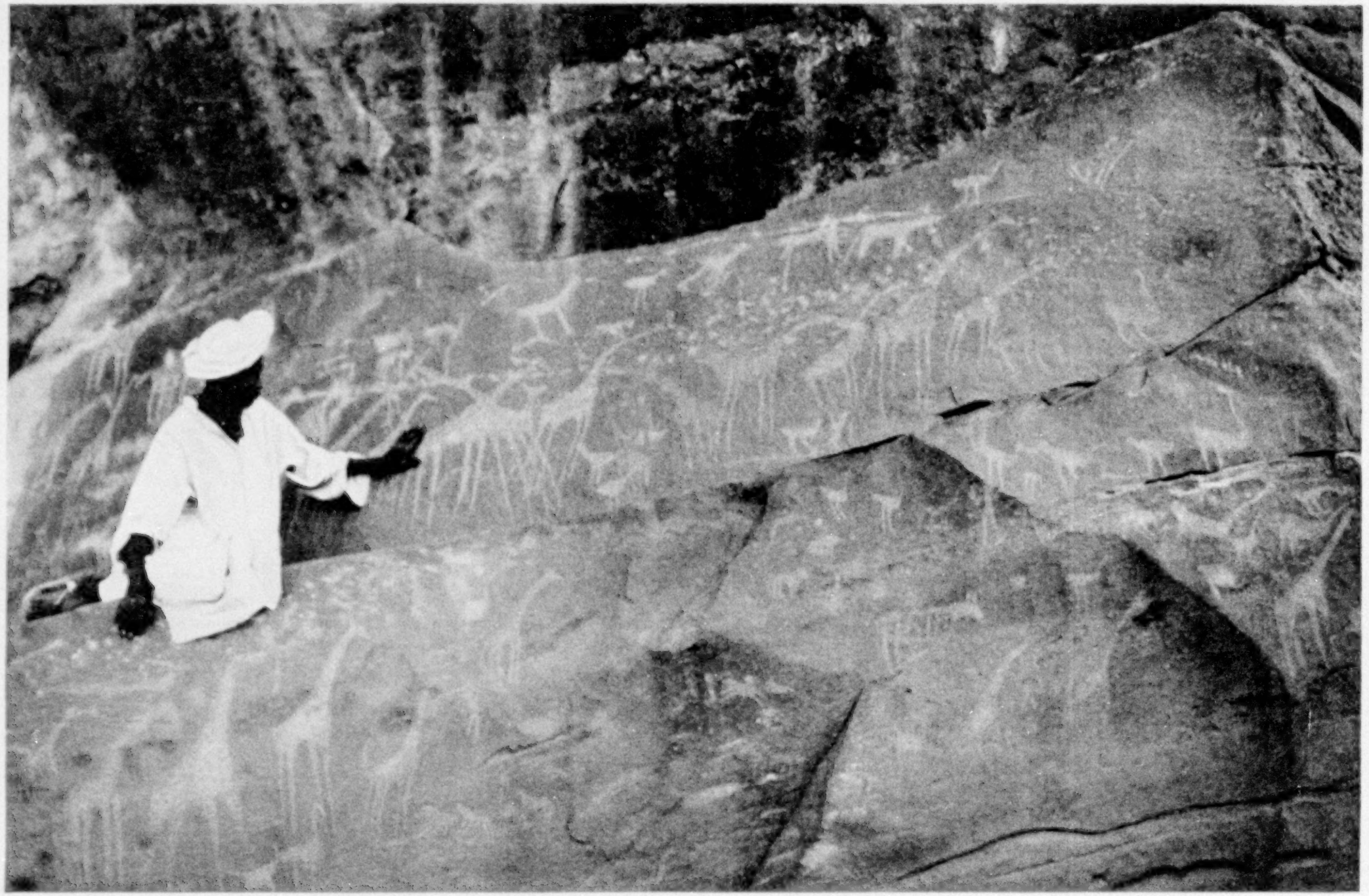
The enormous boulders of the precipitous cliff have been worn smooth by the sand-blasts of the desert (see text, page 275).

XUM



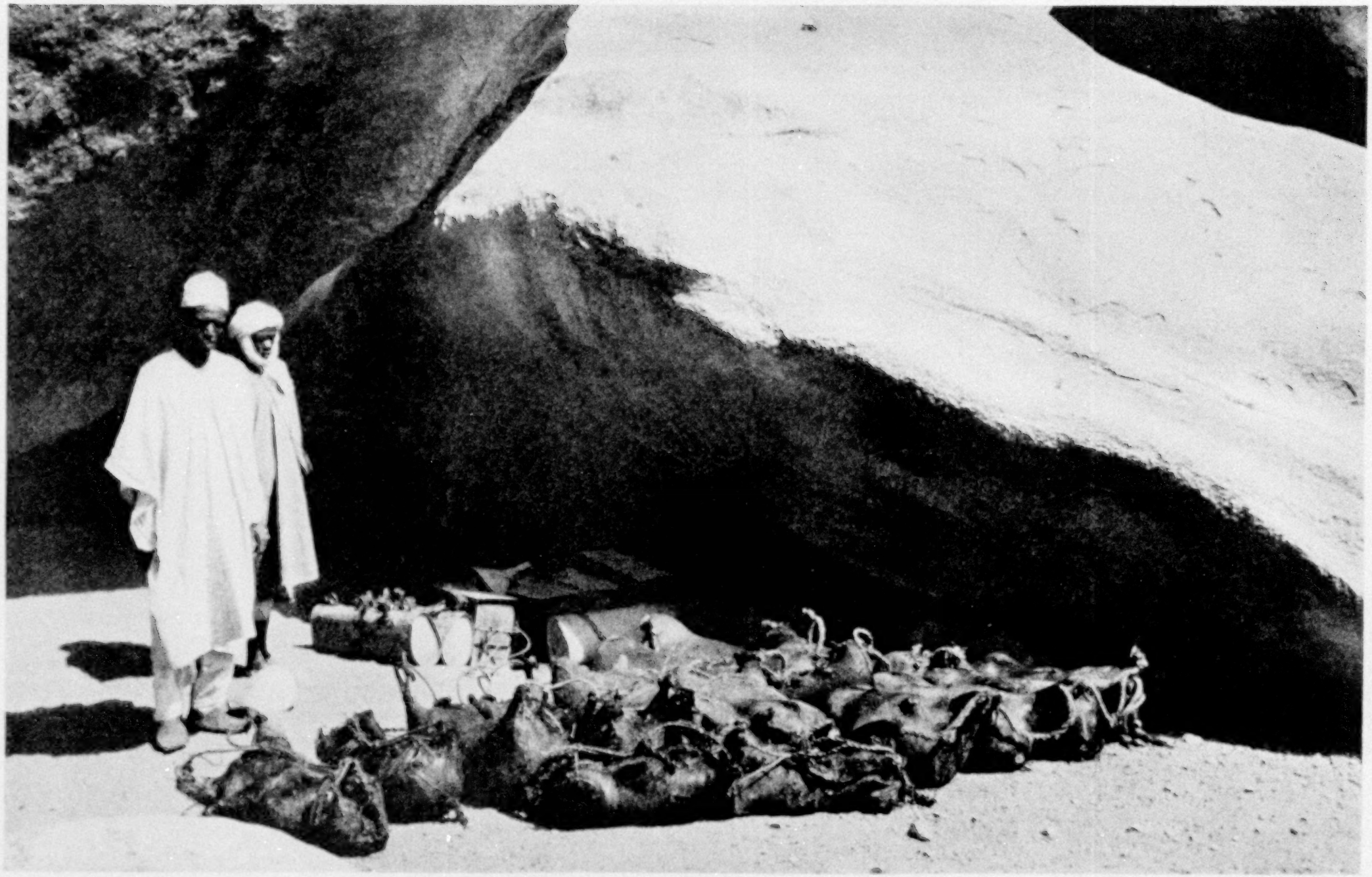
A CAVE UTILIZED AS A KITCHEN FOR THE CARAVAN DURING ITS STAY IN THE OASIS OF OUENAT

Beneath the shadow of these rocks the members of the caravan found some relief from the blistering heat of the outside world.



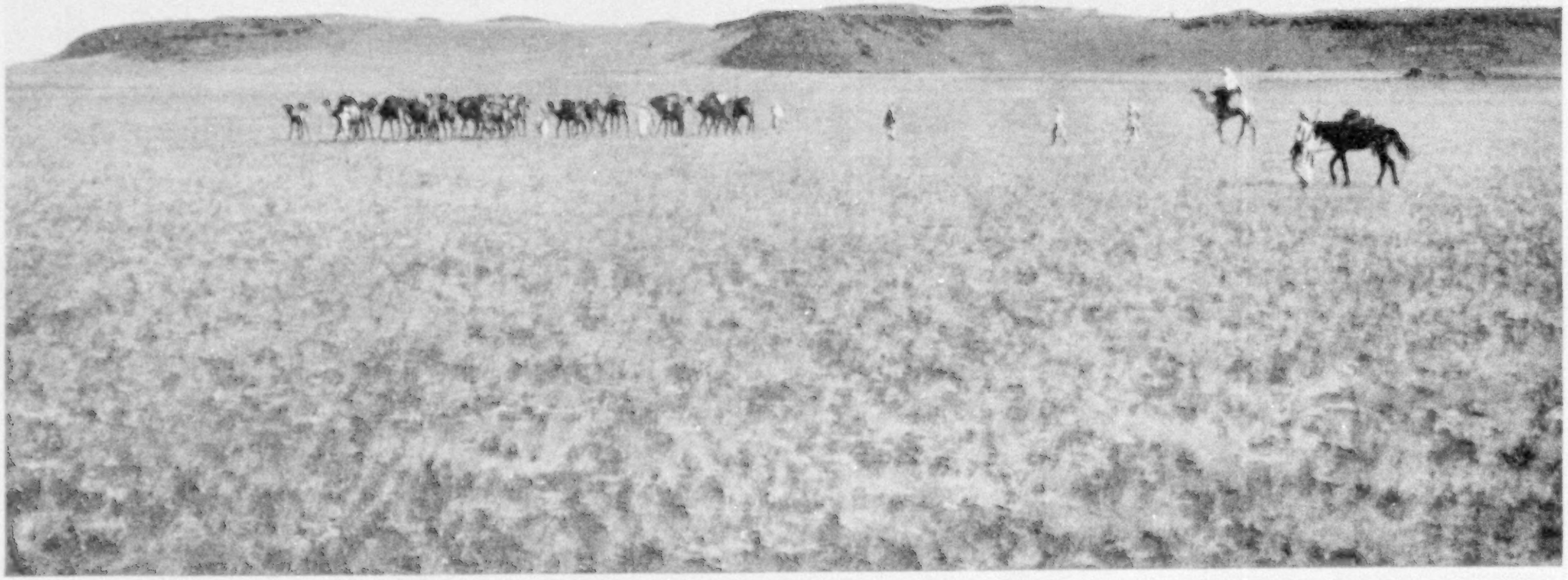
THE MYSTERIOUS ROCK CARVINGS AT OUENAT

Hidden in the heart of this hitherto-unknown oasis are these strange pictographs. Who carved them and when are questions yet to be answered by science, but there are indications that they may antedate the Christian era (see text, page 276).



THE WATER SUPPLY FOR THE CARAVAN

An average water-load for a camel on march is four sheepskins, each containing six gallons.



THE CARAVAN APPROACHING ERDI: THE COUNTRY CHANGING FROM ARID DESERT TO A PLATEAU COVERED WITH GRASS

This was the most interesting change encountered in the Libyan Desert. It marks the line between the waterless waste and country with sufficient grass for pasturage. Had the expedition not come across this grass, the entire caravan would have been lost.

XUM

CAMPING IN THE VALLEY OF ERDI AFTER AN 11-DAY TREK FROM THE OASIS OF OUENAT

The sheer walls inclosing this oasis are of red rock, and the sands of the floor are likewise red. Note the author's horse, Baraka, in the shade of the trees at the right.

THROUGH THE VALLEY OF ERDI

While there remained many miles of travel for the expedition after reaching this valley, the long, waterless desert treks were at an end. The march to El Obeid was by easy stages, through fertile country, from village to village (see map, page 236).

SONS OF GORAN CHIEFS AT AGAH, BEYOND ERDI

One of the kindliest and most hospitable natives encountered by Hassanein Bey south of Kufra was a chief of this tribe residing in the Oasis of Ouenat. He was known as Sheik Herri, King of Ouenat.

THE MEN OF THE CARAVAN PLAYING DRAUGHTS ON THE SAND

The checkerboard is made by pressing holes in the sand with the fingers. Black and white stones are used for the "men."

DIFFICULT COUNTRY THROUGH WHICH THE CARAVAN PASSED BEYOND ERDI

This is the worst type of country imaginable for both beasts and men, as the sharp stones cut the padded feet of the camels as well as the thin-soled shoes of the men. Travel by night over such land is practically impossible.

A BIDIAT FAMILY

From right to left, the mother-in-law, the husband, the wife, and the son.

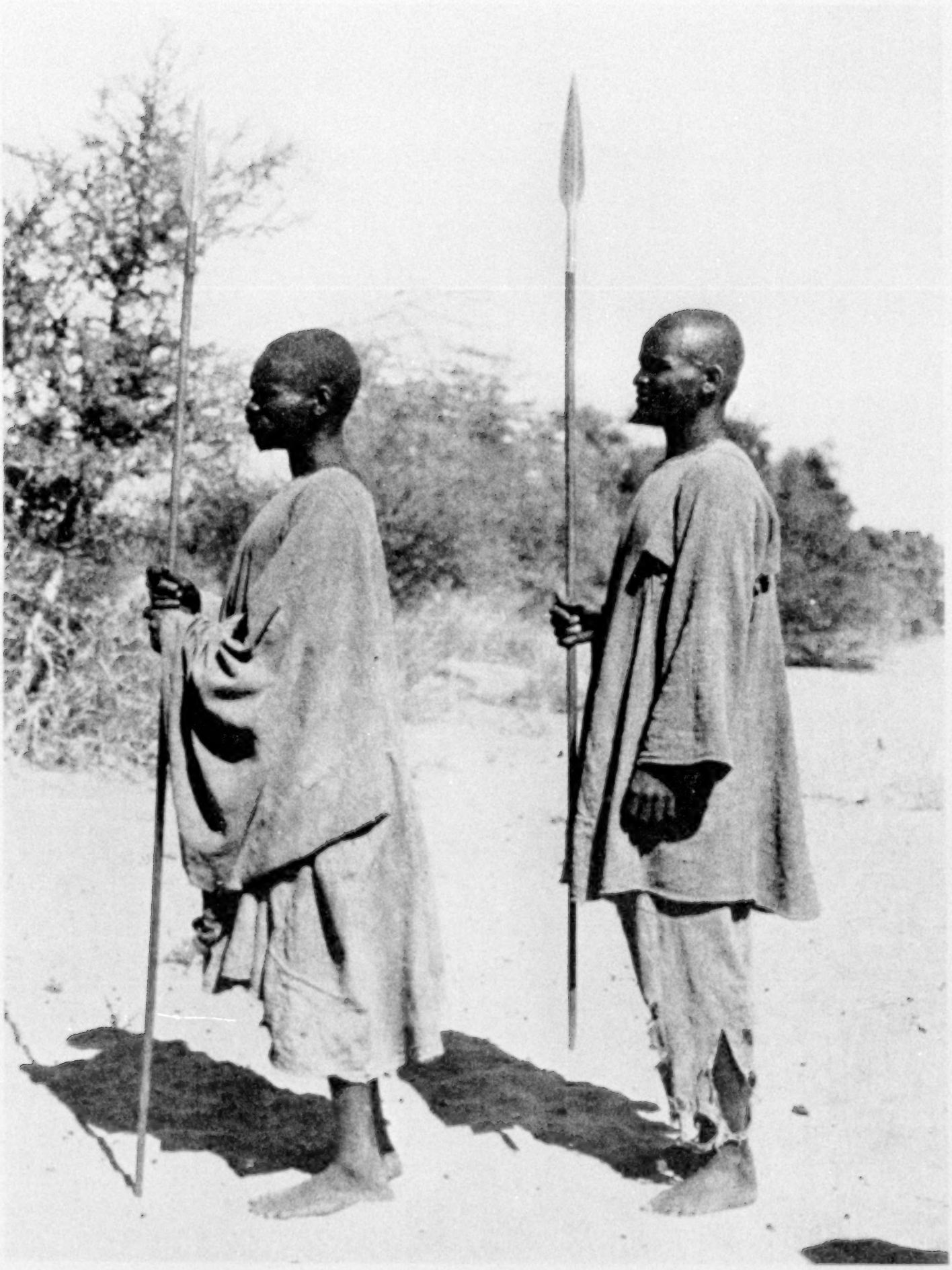
almost invariably concern the virtues of the ungainly but intrepid beast. His praises are sounded in most extravagant terms, and the animal seems to like it.

The camel-driver knows his charge so well that he is able instantly to identify the beast by its footprints in the sands; and not only is he able to do this, but also to identify the son of that camel; in other words, it would seem that each camel family has its own footprint peculiarities.

The average animal will carry a burden of from 250 to 300 pounds, but it is the duty of the astute explorer to supervise the loading at the beginning of each march, seeing always that the camel which carried a heavy load yesterday is given a light burden to-day.

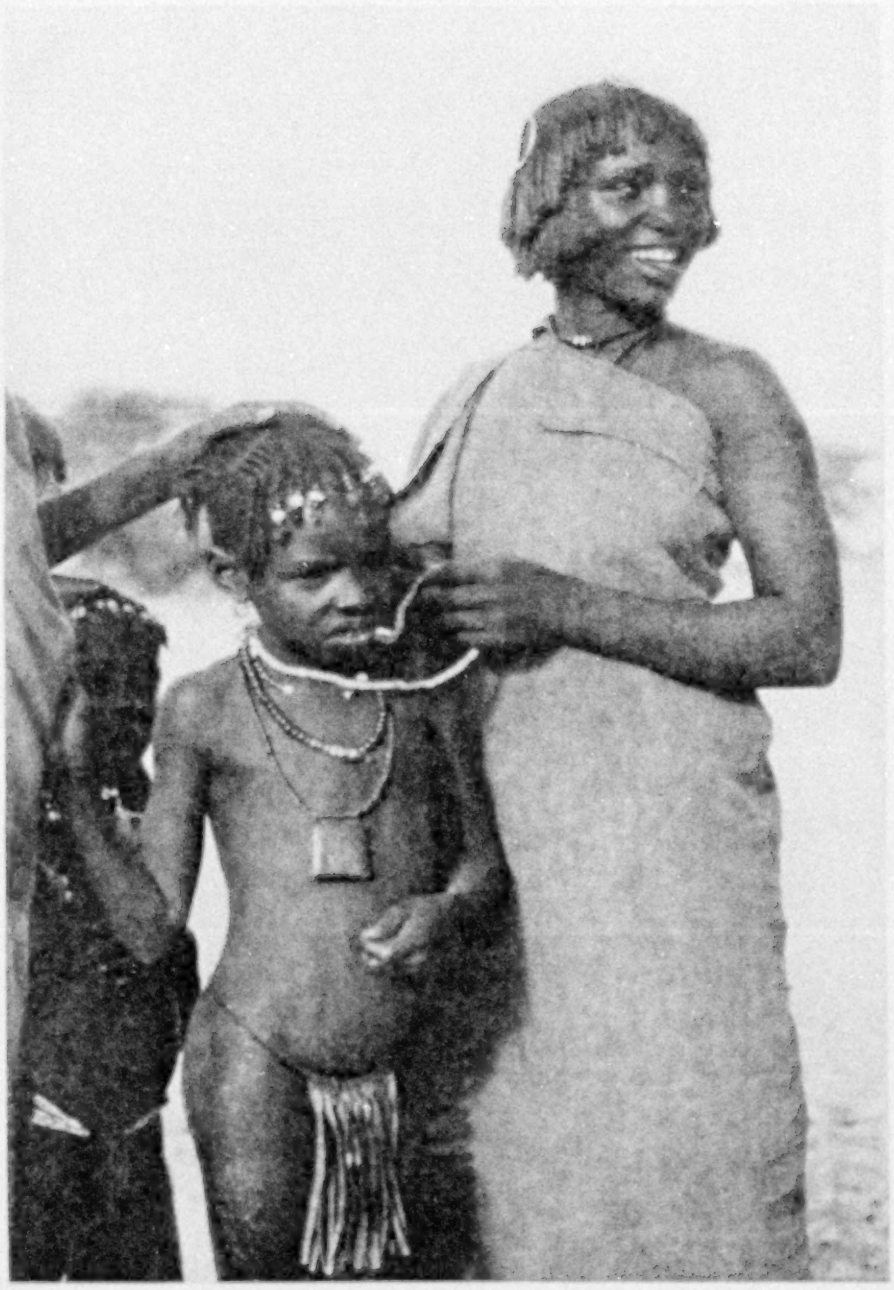
Where supplies are plentiful, the animals are given grass and barley, but in desert trekking, when these are not obtainable, they are fed twice a day on dried dates, a meal consisting of as much fruit as can be gathered together twice in two hands. The animals are serviceable up to 23 or 25 years of age and are valued at from $50 to $100.

It is recorded that, when water supplies have been exhausted, caravan lead-



TWO BIDIAT MEN

"The southern portion of the Libyan Desert is inhabited by tribes of blacks—Tebu, Goran, and Bidiat—who are rather more refined in features than the central African negroes" (see text, page 234).



A BIDIAT GIRL WITH HER SISTER

The child is wearing a macaroni necklace. The author gave the natives macaroni to eat, but they quickly converted it into "jewelry."

ers have slain their weaker camels and the drivers have then extracted all the moisture possible from the stomachs of the animals. In the final extremity, the frothy pink blood has, in some instances, been drunk; but this practice inevitably means the end, for such a draught is comparable to the drinking of sea water by shipwrecked persons.

In winter, in case of necessity, a camel in good condition can go for 15 days without water; in summer, from 10 to 12 days is the limit.

If an animal becomes completely exhausted on a trek, it must be killed. This is one of the saddest experiences of the desert, for a camel is really a member of a caravan and not merely a beast of burden.

GRUELING MARCHES UNDER TEMPERATURE EXTREMES

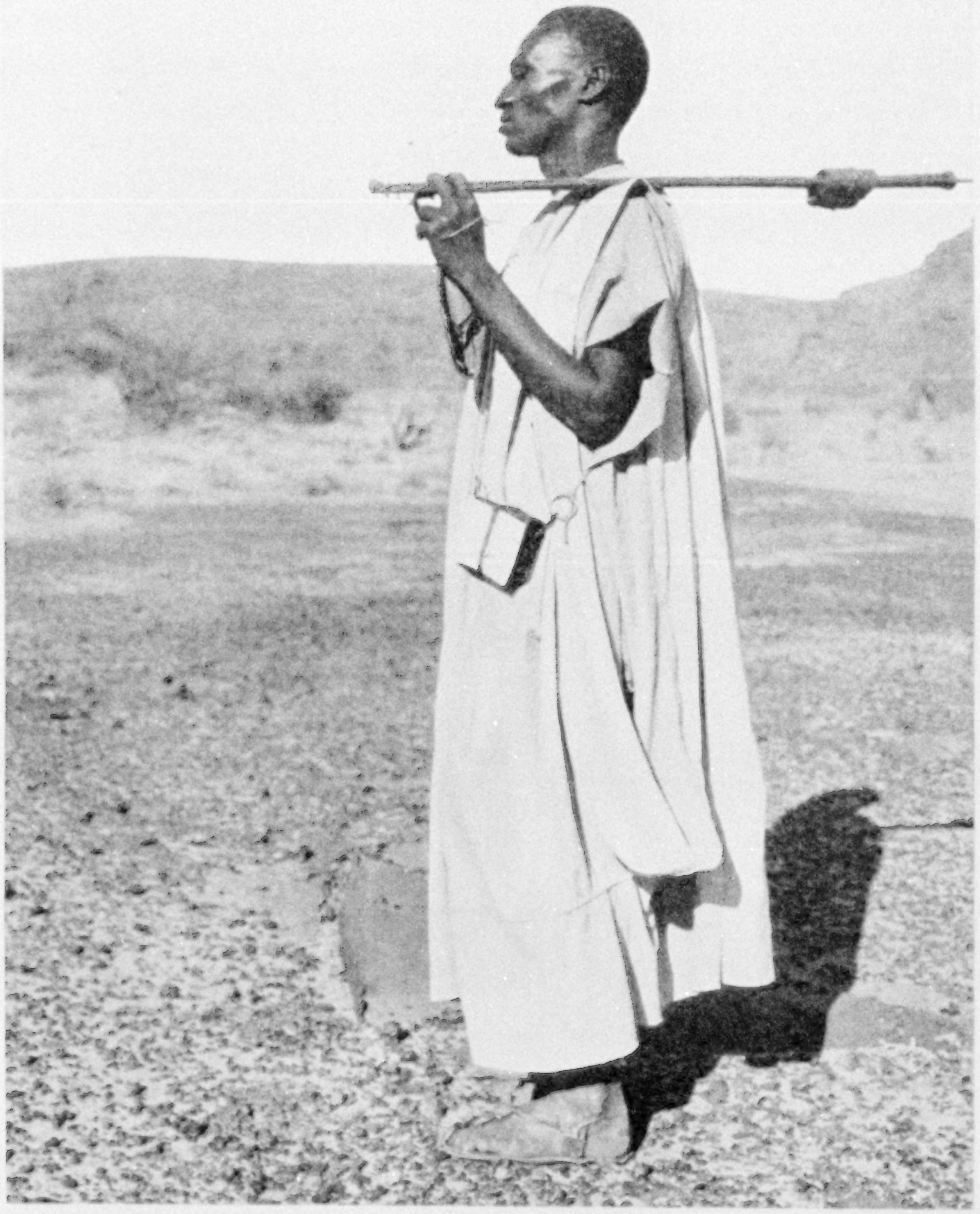
From the standpoint of temperature, the march south from Kufra was the worst stretch of the entire journey, for it was too hot for travel in the middle of the day and too cold at night. We finally found it necessary to break the trek into two parts, starting long before dawn (2 and 2:30 o'clock) and continuing until 9; then resting until 3:45 or 4 in the afternoon and trekking until 8:30 in the evening. For eight days we had only four hours of comfortable sleep in 24.

Finally, one morning just before dawn, after laboring wearily over a series of steep sand dunes, suddenly there loomed up in the distance a range of mountains resembling hoary medieval castles, half hidden in the mist. A few moments later the sun peered above the horizon and flooded these distant gray walls with warm rose and pink (see page 255).

I allowed the caravan to go on without me, and for half an hour I remained seated upon a dune gazing at those hitherto-legendary mountains. For whatever sacrifices I had made and hardships I had endured, there was full compensation in those few moments, as I realized that I had found what I came to seek. Behind those hills lay the valleys of the first of the two lost oases—Arkenu.

The Arkenu range is a series of conical masses rising abruptly from the floor of the desert and sheltering a fertile valley (see page 255).

The oasis has no permanent village, nor is it inhabited throughout the year, but black Bedouins, Tebus, and members of the Goran tribe take camels there during the grazing season. Sometimes, after



A BIDIAT CHIEF

His sword, over his shoulder, is carried ordinarily on the left arm, with his wrist through the thong.

APPROACHING THE SUDAN

The camp at Bao, on the frontier between the French Sudan and the Anglo-Egyptian Sudan.

BIBO HAS AN ARGUMENT WITH A GIFT GOAT

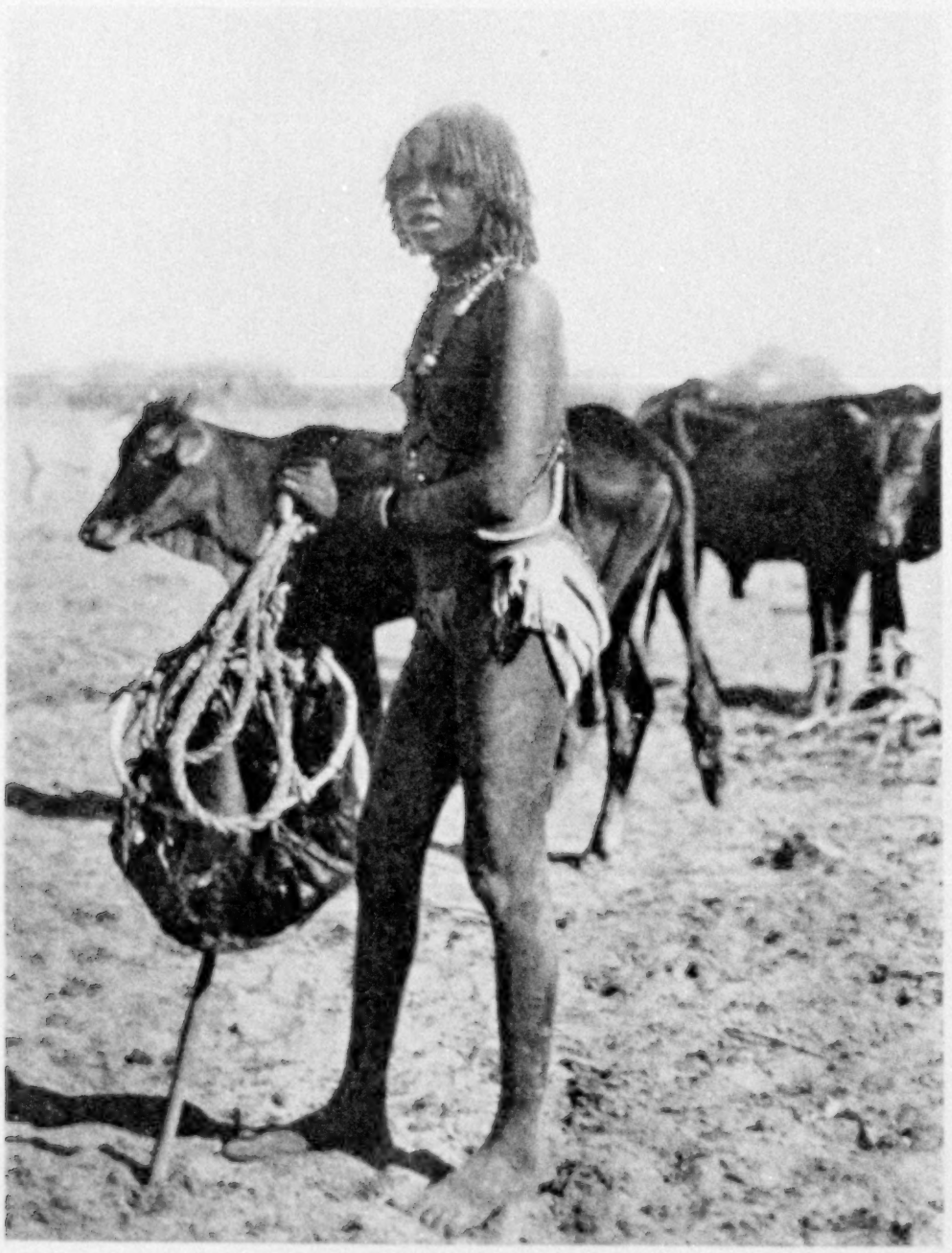
A friendly chief had presented the goat to the caravan as a symbol of hospitality.

driving their herds into the valley, the owners close the narrow entrance with rocks and leave the animals for three months, at the end of which time they are in wonderful condition.

The mountain chain of Arkenu runs for something less than 10 miles from north to south and perhaps 12½ miles from east to west, but I had no opportunity to explore it fully in the latter direction.

The principal interest in this oasis lies in the possibility it affords for exploring the southwest corner of Egypt, which up to the present has not been penetrated either by military parties or by travelers. No one had known up to this time of the existence of a dependable water supply in this part of the desert.

Arkenu may conceivably have strategic value at some future date, for it stands at the meeting point of the western and southern boundaries of Egypt (see map, page 236).



A SUDAN GIRL WITH A HIDE BUCKET

She is wearing a handsome amber necklace, which she refused to sell, even though the author offered gold for it. Amber ornaments are supposed to have found their way into the Sudan from Germany.

BEGINNING THE ALL-NIGHT TREKS

With one-half of our objective achieved, I set forth in high spirits on the short journey to Ouenat.

It was now the end of April, and since it had grown intensely hot, I decided to leave Arkenu at 9:30 in the evening, thus inaugurating our first all-night trek.

There is a tremendous advantage in night traveling, for one never fails to march less than 12 hours and frequently the time stretches to 13 and even 14, our longest continuous trek being for 14½ hours (between Ouenat and Erdi), covering a distance of a little more than 40 miles.

The reason for the longer period of travel at night is that, once a caravan gets under way after the intense heat of the day is over—that is to say, between 4 and 6 o'clock in the afternoon—the advance continues without respite until sunrise.

From 10 to 1 o'clock at night is the most trying period of desert travel. It is then that the vitality of both men and animals seems to be at lowest ebb, and there have been times between these hours when I have felt that nothing

GIRLS OF THE FOR TRIBE NEAR EL FASHER

They are wearing ivory and silver bracelets.

would be quite so welcome as death, with its accompanying eternal sleep.

It becomes almost impossible to drag one foot after the other, and only through the exercise of most rigid watchfulness can sleep be fought off as fatigue increases.

But if night marches have their advantages, they also have their disadvantages, such as difficult, rocky ground—bad going for the feet of men and camels—and when there is no moon, danger of missing one's way in crossing sand dunes, for the guiding star may be lost.

But with the first break of dawn and the appearance of light in the east, the desert traveler seems to take a miraculous new lease on life. It is as if he had been suddenly rejuvenated. Miles seem fairly to reel from beneath his feet, and there comes a jubilation of spirit which is indescribable.

After this rebirth of energy, no desert traveler would consent to halt. He is spurred on by an irresistible force, and this urge continues until the sun has appeared above the horizon, giving warning that the time of heat and suffering has arrived.

It is now that camp must be quickly made, tents raised, food cooked and eaten; then a quick drop into the oblivion of sleep, which can last at most only for three or four hours. After that the heat becomes so intense that there is no opportunity for real relaxation and comfort. It often happened that within 15 or 20 minutes from the time that halt was called in the morning our entire camp would be slumbering.

BEDOUIN GUIDE TAKES BEARINGS BY STARS AND SHADOW

The manner in which a Bedouin guide finds his way across the desert at night is a source of wonder to the uninitiated. In a region which provides no familiar landmarks, he depends solely upon the stars.

As we were proceeding in a southwesterly direction during most of our night trekking, the polestar was at the guide's back. He would glance over his shoulder, face so that the polestar would be behind his right ear, then take a sight on a star to the south in that line. He would march for perhaps five minutes with his

eye riveted on this star, then turn and make a new observation of the pole-star; for, of course, the star to the south was constantly progressing westward. He would then select a new star for guidance and continue.

One of the possibilities of losing one's way in the desert, even when accompanied by a capable guide, may be due to the fact that, after a long series of treks, when days are so hot as to provide insufficient rest for the party, the guide may dose as he walks and thus keep his eye fixed too long on the same star. His bearing in this way shifts westward, out of the true line of march.

Knowing the method by which the Bedouin keeps his direction, one is not surprised that, between sundown and the appearance of the stars, he is completely lost and is a helpless figure in the desert. At that hour of the evening, and also in the early morning, when the stars had disappeared but the sun had not risen, it was necessary for me to take the lead, following my compass bearings.

OUENAT IS SIGHTED

At 6 o'clock on the morning after our first all-night trek, we came to the northwest corner of the Ouenat Mountains and an hour later had made camp under their rocky walls.

The range in that vicinity rose in a sheer cliff from the desert floor. Heaped against it were masses of boulders (see illustration, page 258). which through the ages had been worn smooth by the grinding, polishing action of wind and sand. It was as if here were piled the arsenals of Stone-Age giants whose weapons had been Gargantuan slings.

We found ample supplies of water in the deep-shaded recesses of the cliffs. Both Arkenu and Ouenat differ from all the other oases of this part of Egypt, in that they are not depressions in the desert with underground reservoirs, but mountain areas, where rain water collects in natural basins in the rocks. There are said to be seven such basins at

A BIDIAT MOTHER AND HER BABY

Her style of coiffure is almost identical with that of the Tebu girl of Siwa (see page 250). Note the nose bead. Her hair was plaited when she was young and has been oiled from time to time, but never combed out.

EL FASHER, CAPITAL OF DARFUR PROVINCE

(For an account of Darfur, see "Adventures in Eastern Darfur," by Major Edward Keith-Roach, in THE GEOGRAPHIC for January, 1924.)

Ouenat. I visited four and found the water of each cool and of good quality.

MYSTERIOUS ROCK CARVINGS

It was in Ouenat that I made the most interesting find of my 2,200-mile journey. I had heard rumors of the existence of certain pictographs on rocks, so shortly before 8 o'clock on the evening of our arrival I set out to find them. With a small contingent of my caravan I traveled all night and until the next morning at 10 o'clock, stopping only for prayers. After breakfasting on rice, with the inevitable Bedouin tea, we slept until 4 in the afternoon. Upon waking, I was led by a native to the picture rocks (see illustration, page 260).

The animals are rudely drawn, but not unskillfully carved. There are lions, giraffes, ostriches, and all kinds of gazelles, *but no camels*. The carvings are from a half to a quarter of an inch deep and the edges of the lines in some instances are considerably weathered.

"Who made these?" I asked Malakenni, the Tebu.

He expressed the belief that they were the work of the *jinn*. "For," he added, "what man can do these things now?"

What man among the present inhabitants, indeed!

Here is a puzzle which must be left to the research of archeologists. Suffice it to say that there are no giraffes in this part of Africa now, nor do they live in any similar desert country anywhere.

Perhaps even more significant is the absence of camels from the drawings. If they had been native to the region at the time that the carvings were made, surely this most important beast of the desert would have been pictured. But the camel came to Africa from Asia not later than 500 B. C.

Can these carvings antedate that event? Or has the character of this country undergone such astonishing modification as to have converted into desert a fertile region in which the giraffe roamed and the camel was not a familiar burden-bearer?

With the inspection of these rock carvings, my hasty exploration of Ouenat was concluded.

It was now my chief concern to get safely back to civilization with the scientific data which I had collected, including the verification and the location of these two hitherto-mythical oases.

LAST STAGES OF THE JOURNEY

The march from Ouenat to Erdi, on the French Equatorial Africa frontier, was one of the most difficult experiences of the entire six months of travel. It required long treks over very difficult rocky country.

The caravan was now piloted by an old man of the Goran tribe. He was nearly 65 years of age, was lame, and had not been over that portion of the desert for seven years; but he would trek 12 hours or more each night, and in the morning would still have the most benign expression imaginable.

He was a wonderful son of the desert, and without his help I do not think I could have completed the last leg of the journey. Yet on more than one occasion even he faltered and his "God knows best" (see page 249) was said with quavering uncertainty.

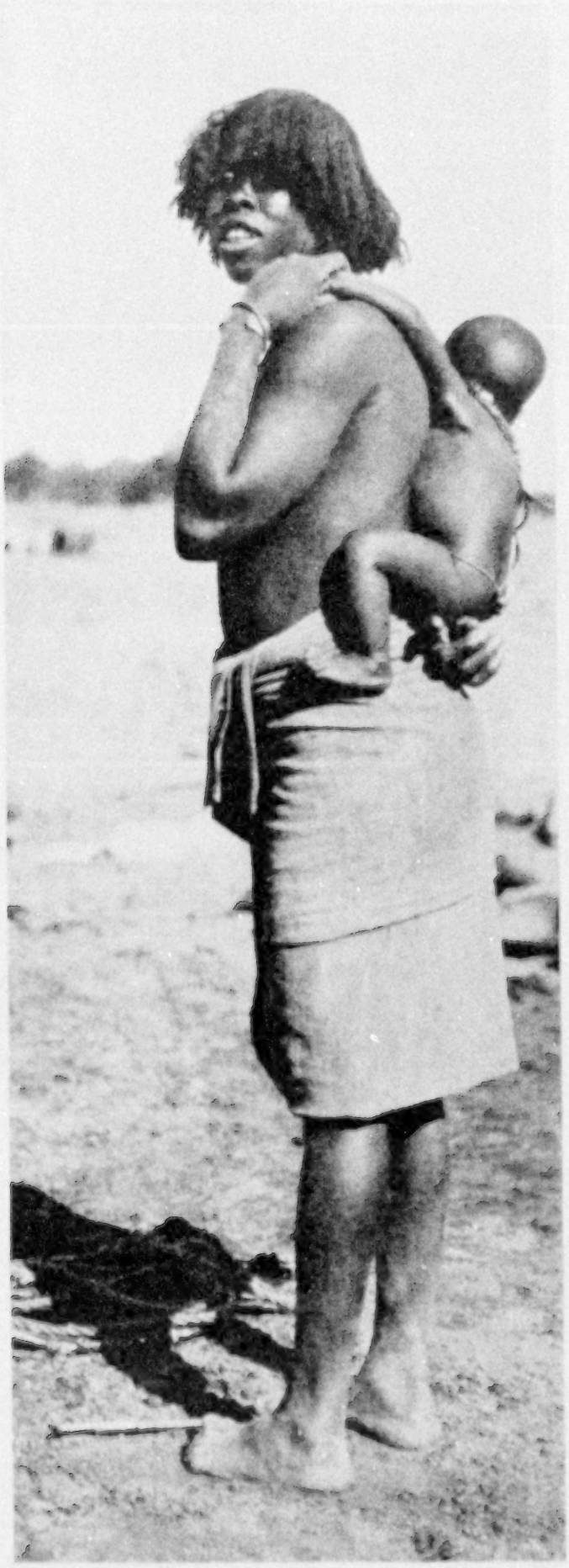
Some of our camels dropped by the wayside and had to be destroyed, while my men were constantly falling out of line to catch a half hour's sleep, then rejoining the caravan at accelerated pace.

Our water ran low and there was more than one night when I thought that the desert would reclaim its secret of the hidden oases by blotting out our little party and swallowing us in the sands.

Happily, we came through, and on the morning of the eleventh day we descended into the valley of Erdi, with its trees, its welcome grass, and its water.

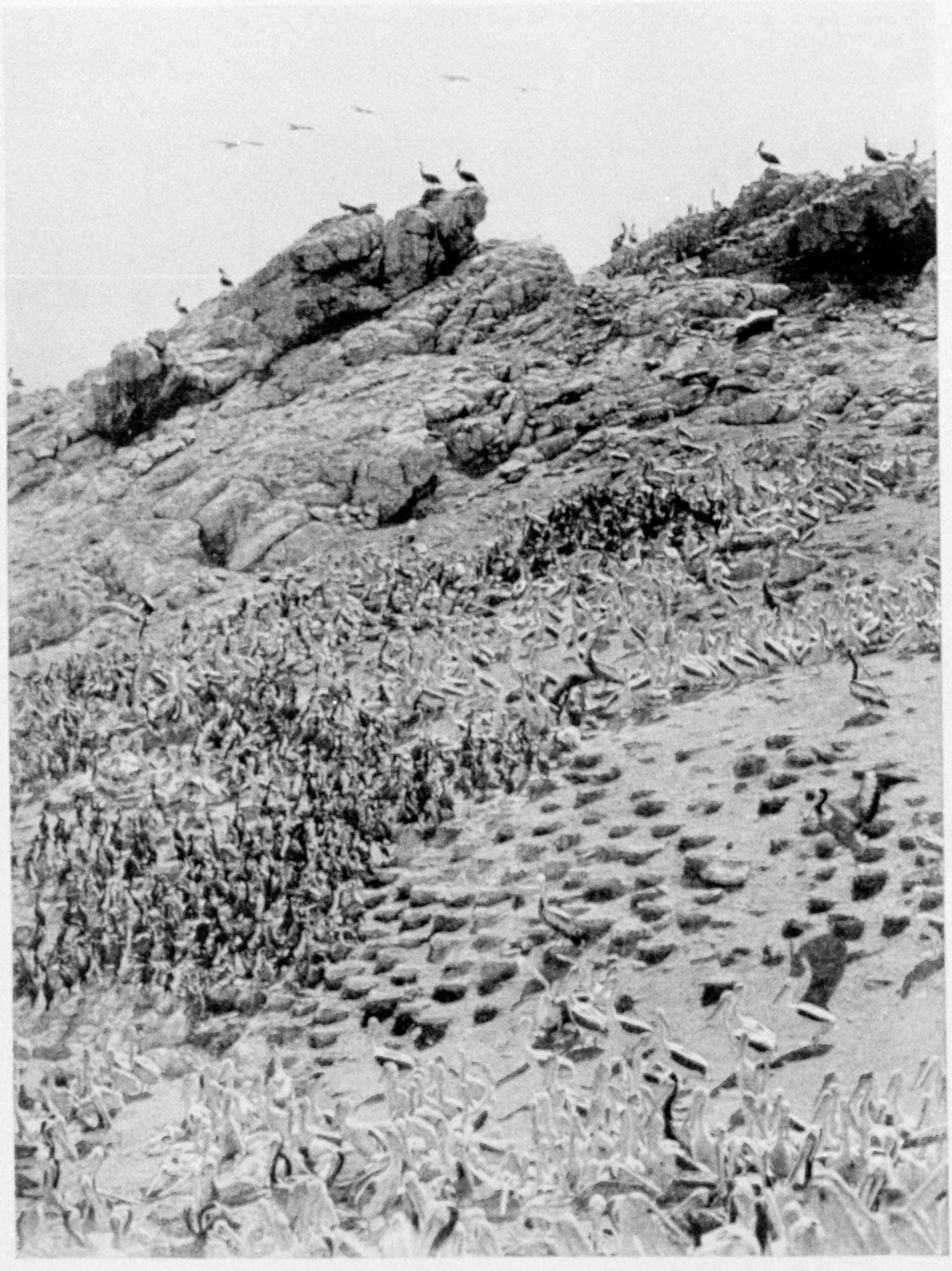
We had still far to go to get in touch with civilization again, but the treks between wells and villages were comparatively short and devoid of unusual hardships, while the natives were no longer unfriendly.

Our receptions at El Fasher and at El Obeid were such as to gladden the heart of him who has wandered into far places and has returned home with the objectives of his journey luckily accomplished.



AN UNCOMFORTABLE PERCH FOR THE INFANT

The mother is a Zaghawa girl whose features are much coarser than those of her desert sister, the Bidiat woman shown on page 275.



STEPLIKE NESTS OF THE GUANAYES ON A SLOPE OF A VALLEY ON LOBOS DE TIERRA ISLAND, OFF THE COAST OF PERU

In the foreground, and mingled among the cormorants on the hillside, are the half-grown chicks of pelicans; adult pelicans stand along the crest, and still others are in flight.

THE MOST VALUABLE BIRD IN THE WORLD

By Robert Cushman Murphy

American Museum of Natural History, Author of "South Georgia, an Outpost of the Antarctic," in the National Geographic Magazine

With Illustrations from Photographs by the Author

THE title of this article is a statement of opinion, not a claim to omniscience. What mortal can appraise a living creature? Which of the 18,000 or more existing kinds of birds that gladden every land and sea can be called most valuable, and upon what criteria?

Excluding from the reckoning domestic poultry of all sorts, as well as the stork, which, wherever European tradition holds sway, is saddled with the responsibility for our very existence, we may cast about almost at random and might consider, for example, the swallows, which spend their days in ridding the air of insects that in one way or another are detrimental to the growth of vegetation.

With less satisfaction but equal justice, we might turn to vultures and other scavengers which, throughout the Tropics and large portions of the Temperate Zones, clear away carrion which results from the common fate of all animals.

We should have to take account also of many important game birds, sources of sport and food to myriads of human beings; of woodland dwellers, such as the jays, which directly or indirectly plant forests; of the humming birds, which, aside from being incomparably beautiful feathered creations, fertilize in the American Tropics the loveliest of all plant forms, the orchids.

Nor may we omit to think of the egrets and birds of paradise, victims of an immeasurably large traffic, which pay with their blood for the value man sets upon them.

MANY BIRDS HAVE ENDEARED THEMSELVES TO MANKIND

And yet few would admit that the qualifications of the birds mentioned weigh heavily in the balance against those of more familiar kinds, which in all parts of the populated earth have from time immemorial endeared themselves by their never-failing seasonal presence, their boldness, their beauty of voice or color, their exemplary parenthood, or even by the seeming possession of such foibles as mischievous or irritable temperaments, with which man can sympathize because he so well understands them.

Therefore, lest our standard of worth be obliged to compete with the inspiration which Shelley and Keats derived respectively from skylark and nightingale, or which Anatole France, in a different field of letters, drew from certain flightless and extraordinarily manlike seafowl, it should be stated that we are here taking no account of esthetic or traditional values.

Figuring in dollars and cents, and with reference to effect upon human life and human geography, we beg to present our candidate for the post of king among avian benefactors—the Peruvian cormorant or *guanay*, known to science by the ponderous name of *Phalacrocorax bougainvillei*.

Readers of the National Geographic Magazine will recall that they have already made the acquaintance of the guanay through an illuminating description of "Peru's Wealth-Producing Birds," by Dr. Robert E. Coker, which was published in the issue of June, 1920. Dr. Coker's remarks on this cormorant were included in a general account of the ornithology and life conditions of the Peruvian coast, and were based, moreover, upon investigations made during the years 1906 and 1907. Recently the writer has had the enviable opportunity of working in the same field, with Dr. Coker's manuscript notes in his possession.

Since the status of the guanay has changed greatly during the intervening years, partly as a result of one of the most effective steps toward conservation that has ever been put into force, this classic sea bird is well worthy of more extended commemoration.

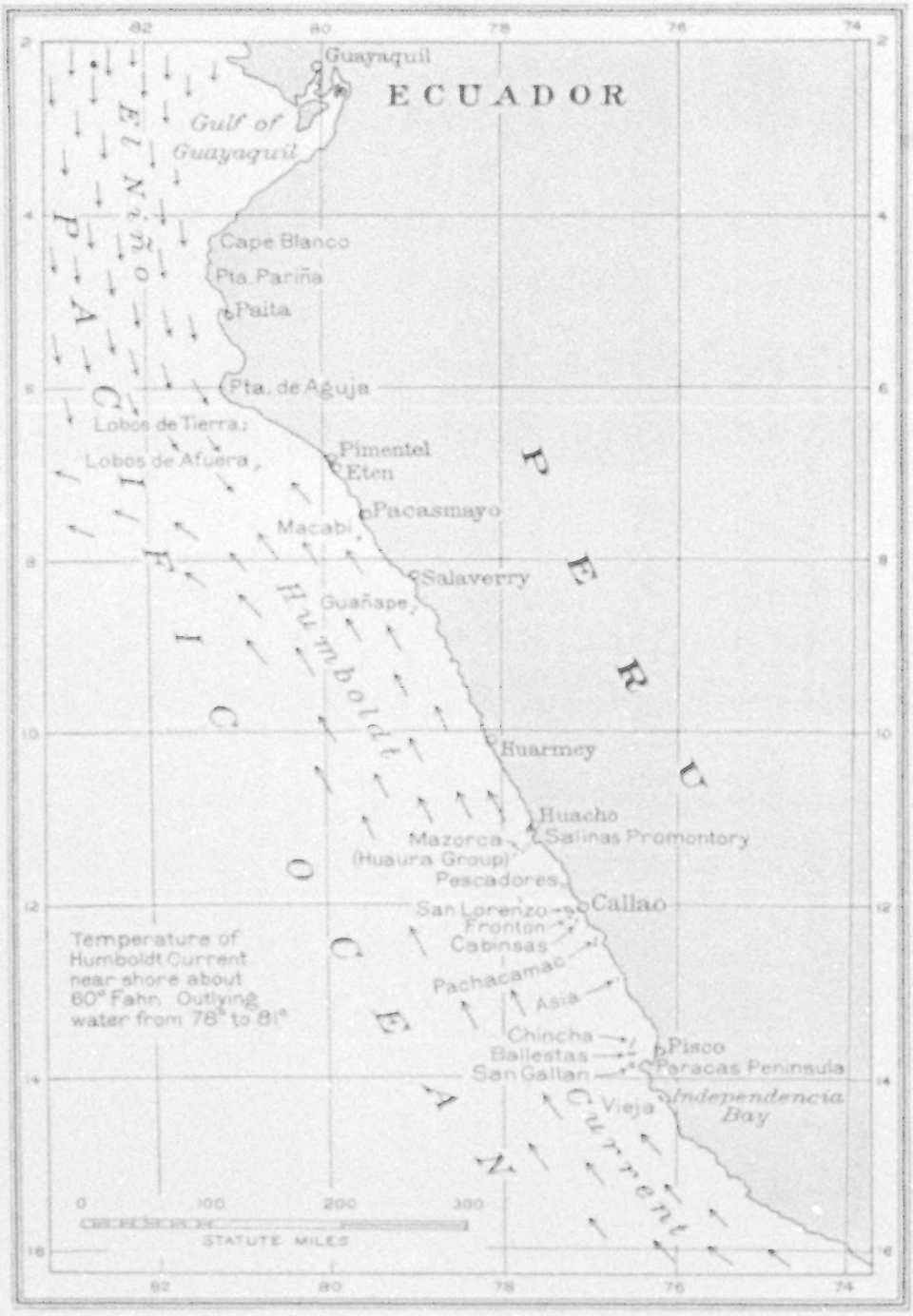
For an adequate description of the

XUM

GUANAYES TAKING FLIGHT: CENTRAL CHINCHA ISLAND

FLIGHT STUDIES MADE AT THE PESCADORES ISLANDS

The guanay differs from all other cormorants in that it hunts its prey from the air like a hawk (see text, page 285).



Drawn by A. H. Bumstead from the author's sketch

A MAP OF THE PERUVIAN COAST

Showing the islands on which the guanayes have their rookeries.

geographic and climatic environment in which the guanay exists in countless millions, the reader is referred to Dr. Coker's paper. Suffice it to say that the range of the species is restricted to coastwise waters along the arid, western shores of South America between Point Pariña, just south of the Gulf of Guayaquil, and the vicinity of Corral, Chile.

A CREATURE OF THE HUMBOLDT CURRENT

This stretch of shore line, some 2,400 sea miles in length, is bathed by a relatively narrow, northward-flowing oceanic stream, the Humboldt Current, the water of which is notably cooler than that of the outlying tropical Pacific.

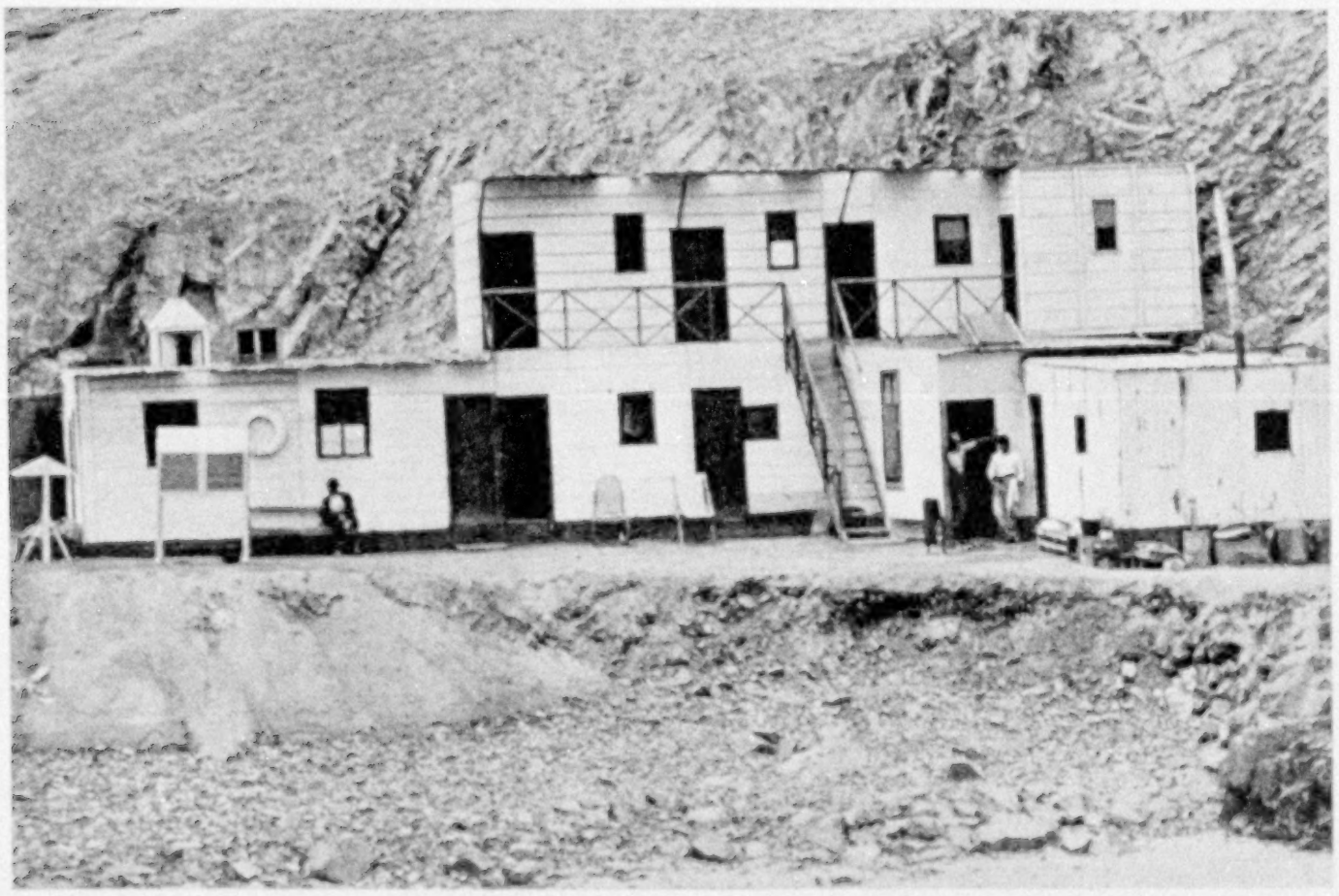
Chiefly because of its low temperature, the current is peopled by a probably unequaled profusion of marine organisms, including anchovies and other small fishes which are the food of the guanay, and which, because of their vast numbers, make possible a correlated abundance of the birds.

The guanayes are strictly creatures of the Humboldt Current; their huge flocks move up and down the coast as the birds forage among migrating schools of fish; they breed, likewise in vast numbers, upon the many islands lying from one to a score of miles from the coast; but they do not stray outside the field of the current, to the northward, the southward, or offshore.

The islets of the Humboldt Current, which are most thickly distributed along the northerly two-thirds of Peru, partake of the same desert character of the opposite continental mainland. This climatic fact is the secret of the guanay's economic importance, for the guano or excrement of sea birds is preserved on the nesting grounds without loss of fertilizing efficacy such as would be caused by moisture.

From prehistoric times guano from these islands has been used in the agriculture of the native peoples of Peru,* but the importance and money value of this

* An excellent summary of the history of guano from antiquity, as well as of the wanton system of exploitation which obtained during the latter half of the nineteenth century, is given on pages 539-543 of Dr. Coker's article in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1920.



GUANO ADMINISTRATION LABORATORY AND GUARDIAN'S RESIDENCE ON CENTRAL CHINCHA ISLAND

The meteorological observatory is in the left wing. The upper floor of this building was given up to the author during his visit.

natural fertilizer and of its chief producer are greater to-day than at any time in the past.

DENSE MASSES OF BIRDS PRESS ALONG THE SEA

Picture to yourselves the shining, rainless coast of Peru, washed by ocean waters to which storms are unknown, where the swells surge northward from month to month and year to year before winds that blow regularly from a southerly quarter. On such an ocean dark flocks of guanayes form rafts which can be spied miles away.

Slowly the dense masses of birds press along the sea, gobbling up fish in their path, the hinder margins of the rafts continually rising into the air and pouring over the van in some such manner as the great flocks of passenger pigeons are said to have once rolled through open North American forests in which oak or beech mast lay thick upon the leafy floor.

At other times, when the guanayes are moving toward distant feeding grounds, they travel not in broad flocks, but rather as a solid river of birds which streams in a sharply marked, unbroken column, close above the waves, until an amazed observer is actually wearied, as a single formation takes four or five hours to pass a given point.

Equally impressive are the homeward flights of these cormorants after a day of gorging upon anchovies, when in late afternoon slender ribbons, wedges, and whiplashes of guanayes in single file twist and flutter, high in air, toward the rounded plateaus of white islands, which gradually turn black as the packed areas of birds swell out from clustered nuclei toward the borders of the available standing room (see pages 296 and 298).

Whence came this astounding sea bird, which has made the Peruvian coast its own? The evolutionary history of present-day animals is in most cases impossible to decipher unless we have a clear fossil record such as, for example, that of the camel, which is known to have originated during the early part of the Age

THE GREAT COLONY AT SANTA ROSA JUST AS THE GUANAYES BEGAN TO POUR OUT TO SEA

More than a billion dollars' worth of guano has been taken from the islands along the Peruvian coast.

of Mammals in the western United States, where it no longer occurs, and to have spread thence by diverse routes to Asia and to South America, where highly modified descendants of the North American progenitors are still found.

Palæontology offers no such clue to the primeval home of the guanay's ancestors, but fortunately we can read the history of the species in other pages of Nature's text-book. For the guanay belongs to a well-defined *antarctic* branch of the cormorant family, all the members of which are characterized by certain anatomical peculiarities, as well as by external marks, such as white breasts and "warts" above the bill.

The other species of this branch inhabit high southern latitudes. The guanay's nearest relatives, in fact, are cormorants of the Strait of Magellan, New Zealand, various subantarctic islands, and the shores of the Antarctic Continent all around the pole, while its relationship with other cormorants of South America, or with those of any part of the Northern Hemisphere, is relatively remote.

ANTARCTIC BIRD MAKES ITS HOME NEAR EQUATOR

In the northward extension of this representative of an antarctic group to a point within six degrees of the Equator, we recognize one of the profound effects of the Humboldt Current. The cool stream, lying between a tropical continent on the one hand and the heated surface waters of the open South Pacific on the other, forms, as it were, a tongue of littoral ocean in which the environment, and consequently the marine flora and fauna, is such as ordinarily holds for the subantarctic zone rather than for equatorial or even temperate seas.

This condition is more or less common to all western continental coasts, but nowhere are its results, as expressed in the distribution and abundance of life, so marked as in the Humboldt Current.

Given, therefore, a belt of cool ocean waters replete with small organisms of more or less polar type, together with nesting sites upon islands which for climatic reasons could never become encumbered with vegetation, and the geographic stage was set for the northward emigration of the ancestors of the guanay.

Furthermore, because of the normal superabundance of food, conditions seem to have been prearranged for the increase of the birds to numbers limited only by competition with other animals and by the amount of safe, insular space for reproduction.

Although suitable islets are very numerous, the enormous food supply in the Humboldt Current is still out of all proportion to the area of the breeding places. This doubtless explains the excessively colonial nesting habit of the guanay, in which it surpasses all other birds, even the penguins, for in the middle of a bounteous sea there would be a constant tendency for the cormorant population to become more and more congested upon the islets. The doctrine of Malthus applies to birds as well as to men.

THE GUANAY FISHES BY SIGHT

These facts suggest that the geographic background does not tell the whole story. Evolution is, at least in part, the result of interaction between a living being and its surroundings. The guanay itself has had to undergo considerable modification in order to fit into a new environment, especially as regards the particular character of its food in the Humboldt Current.

Several such adaptive changes are apparent, changes which have progressed so far that they now strongly differentiate the Peruvian species from its antarctic cousins and from every other kind of cormorant in the world.

For instance, the guanay, unlike any other cormorant, "hawks" its food—that is, it hunts exclusively by sight and from the air, locating the fishes which it seeks before descending to the water to catch them.

Most cormorants search for their prey individually, swimming alone or in loose groups at the surface, then plunging in what seem to be favorable places and conducting the hunt as well as the capture while they are submerged. For the most part, moreover, they subsist upon bottom-living species of fish, often diving down many fathoms in pursuit of single victims.

But the guanay feeds altogether upon surface-swimming fishes, such as anchovies, young herrings, and the toothsome silversides which the Peruvians call

GUANAYES INCUBATING SECOND SETS OF EGGS AT PESCADORES ISLANDS

Some of the nests weigh as much as 12 pounds apiece.

pejerreyes (kingfish). Such forms travel in tremendous schools, which are assailed *en masse* by proportionately large flocks of birds.

SCOUT BIRDS SENT OUT TO LOCATE SCHOOLS OF FISH

The correlation between the numbers of the fishes and the extreme gregariousness of the cormorants results among the latter in a system of efficient co-operation which almost suggests certain customs of ants or other social insects.

The vast flocks of guanayes which spend their nights upon the islands do not start hunting in a body when morning breaks. On the contrary, the birds first sally forth only in small scouting parties, which can be seen flying erratically above the ocean, usually keeping well in air, and frequently "back-pedaling" or hovering when they see the silvery glint of schooling fish or the ruffled appearance of the sea, which indicates the presence of fish below.

The dropping of the scouts to the surface and the shallow dives which mark the beginning of an orgy are the signals that cause the approach of such rivers of birds as have been described (p. 283). The cohort of guanayes then spreads out like a great fan over the unfortunate anchovies, which are likely to be no less harried from beneath by bonitos and sea lions.

GUANAY FAMILIES, SHOWING THE CHICKS IN VARIOUS STAGES

From the pepper-and-salt down to the sleek gray plumage of the fledgling.

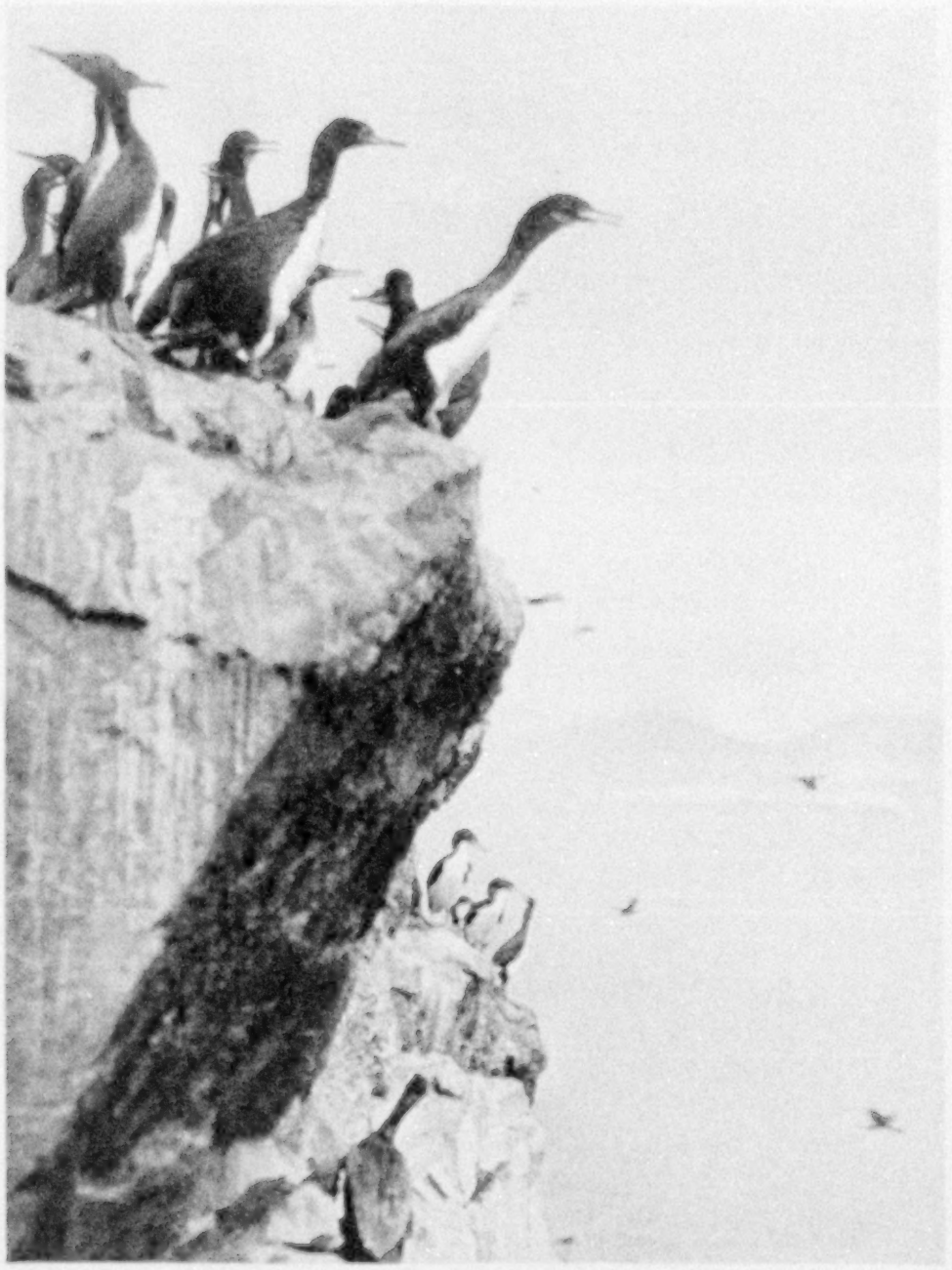
Small wonder that the Peruvian fishermen who are familiar with such sights, believe that the guanayes and the seals have a working understanding! However this may be, the gorging proceeds until both sea lions and birds must cease long enough to allow their rapid digestions to fit them for another meal. From the crop and gullet of a dead guanay the remains of no less then seventy-six anchovies, four or five inches in length, have been taken.

Sometimes the guanayes pursue the fishes to the very beaches, so that a rare view of a one-sided fray may be enjoyed by a landsman. One morning during the writer's sojourn at Independencia Bay, Peru, shoals of silversides were packed in deep, glittering ranks close to the quiet shore, when a raft of guanayes, accompanied by a few pelicans and a horde of screaming gulls, drove the fishes before them against the shelving sand.

Soon the water gleamed like flashing quicksilver, and in wild rioting the birds jammed and crowded each other until hundreds of them were pushed clear beyond the tide-line by the scrambling mob behind.

THE GUANAY WALKS ERECT LIKE A PENGUIN

The guanay stands and walks erect, somewhat after the manner of a penguin. Its height is in the neighborhood of 20 inches and the weight of a full-grown



GROUPS OF GUANAYES ON THE CLIFFS OF PESCADORES ISLAND

bird is about four and a half pounds. It has a glossy green and blue-black neck and back, a white throat-patch, which is a conspicuous mark in flight, a white under surface, and pinkish feet. During the courtship season a crest of plumes develops at the back of the head.

The guanay's iris is brown, but an area of green, naked skin surrounding the orbit makes it look at close range like a veritable personification of envy. A second ring of turgid red skin outside the staring "green eye" heightens its extraordinary expression.

Since the fame of the guanay proceeds chiefly from sheer numbers, it is not unnatural that observers have made extremely high estimates or guesses concerning the population of its colonies. The birds breed upon the plateaus and windward hillsides of the Peruvian islands in concentrated communities, the nests averaging three to each square yard of ground (see p. 299).

Dr. Coker's measurements show that no fewer than a million adult birds dwelt within the limits of a single homogeneous colony on South Chincha Island during one of his visits. Another naturalist has written that these cormorants "congregate to the number of ten millions."

BREEDING SEASON IS CONTINUOUS

The breeding season, like that of most tropical ocean birds, is practically continuous, but it reaches a climax during the southern summer months of December and January. In its adaptation to an all-the-year nesting habit, the species has, of course, diverged widely from the ways of its antarctic relatives, the reproductive season of the latter being rigidly fixed by the climatic cycle.

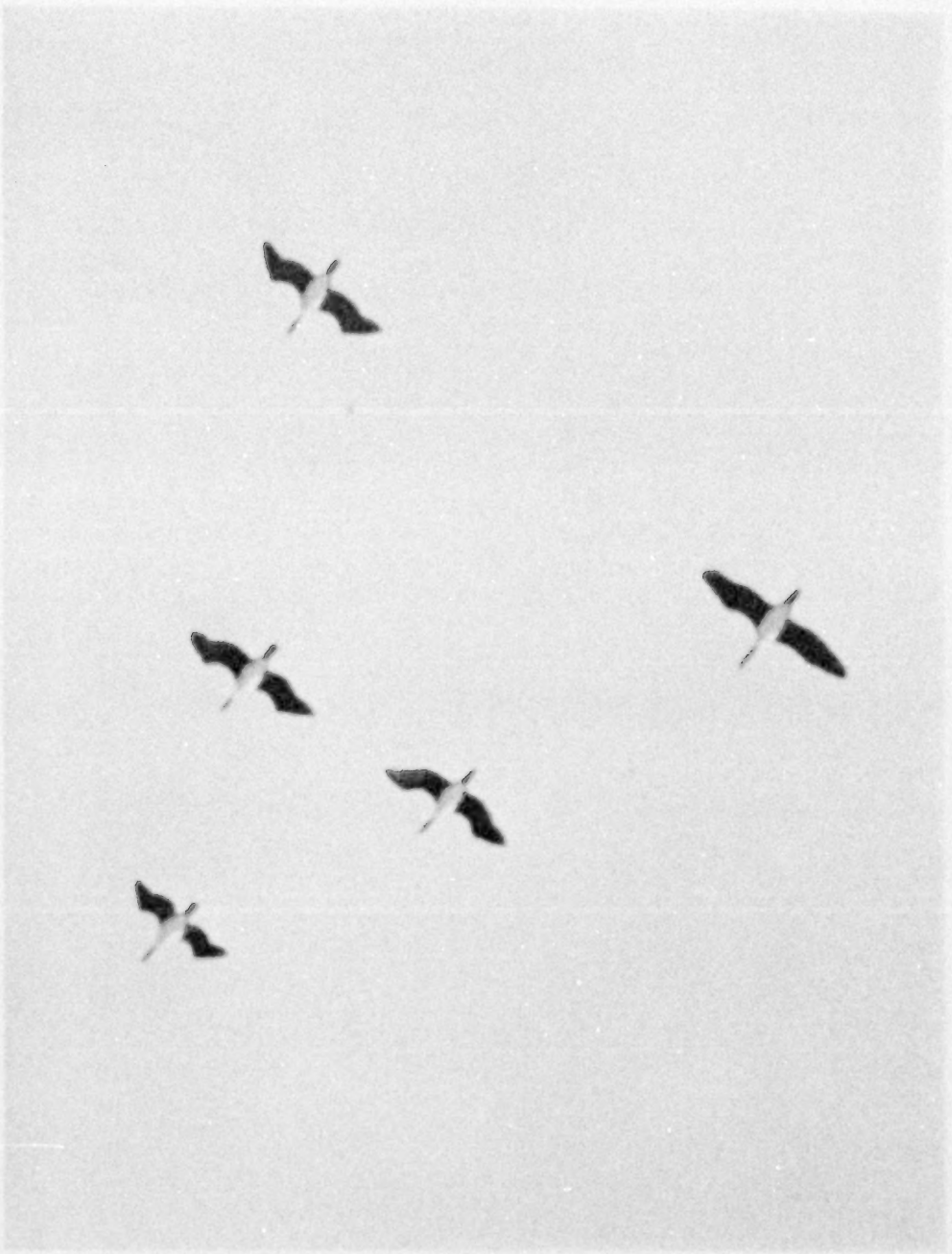
Individual pairs of guanayes are believed commonly to rear two broods during a single year. The flight of the last families of the young of one season, in May or June, is, at any rate, followed hard by the courting and love-making of adults in preparation for the breeding season of the second spring.

In early October, 1919, when the writer arrived at the far-famed Chincha Islands, off Pisco, Peru, the resident guanayes were in the early stages of mating. From this place and date, as investigations were carried northward from island to island, successive manifestations of the birds'

life history were revealed, until at Lobos de Tierra, in January, 1920, full-fledged young were observed taking to the ocean, quite independent of parental care.

At South Chincha Island in mid-October the breeding grounds were covered with just one year's accumulation of sun-baked guano, and the cormorants were getting ready to nest again. They stood in compact bodies, each comprising thousands of birds, and, when a human being approached, all those on the nearer side began to stir—not *en bloc* nor yet individually, but in groups of a few hundred, each of which for the time constituted a unit.

One group would move rapidly away, the birds carrying themselves bolt upright. Another group would advance toward the observer, so that this section of the army would gleam with white breasts instead of shiny, dark backs. Still another unit would rush to the right or to the left, so that both the dark backs and the white breasts showed at once, and the long bills and red nasal warts became conspicuous.



HOMEWARD BOUND GUANAYES ABOVE THE CHINCHA ISLANDS

The birds are seen from directly beneath and are in characteristic wedge and line formations.

Such closely huddled companies soon collided with others moving in different directions, producing much confusion about the margins. A few of the birds showed no fear at all, stolidly permitting a man to approach within a few feet. The greater proportion, however, frantically took to flight, rushing helter-skelter down a slope and raising a cloud of dust with their whistling wings. The air became bewilderingly thick with birds as they circled overhead, but within a few moments the number returning to earth once more exceeded the number taking wing.

THE HUM OF COUNTLESS WINGS

When an observer makes his way slowly and very quietly into the heart of a colony in which nesting has definitely begun, the guanayes gradually retreat, and one may sit down in a clear circle which is at first 50 or more feet in diameter. But almost imperceptibly the birds will edge in again, until the bare circle narrows to but three or four paces. From such a point of view it seems as if the ground were covered with as many pairs of sprawling webbed feet as there is room

FLEDGLING GUANAYES LEARNING TO SWIM IN THE ROCK POOLS OF LOBOS DE TIERRA ISLAND

On the point in the background are groups of basking sea lions.

for, and yet new arrivals plump down by scores or hundreds every minute.

Over the ocean, moreover, to the north, south, east, and west, one may commonly see endless black files still pouring in toward the island (see pp. 296, 297, 298).

The hum of wings is like the effect of an overdose of quinine upon the ears, and the combined voices seem like mutterings of the twelve tribes of Israel. It reminds one of all sorts of strange, oppressive roarings, such as the noise of railroad trains in river tunnels.

The near-by voices, which can be distinguished individually, are merely sonorous bass grunts and "screepy" calls. It is the multiplication of such sounds by numbers almost too large to imagine that makes the outlandish and never-to-be-forgotten babel.

Toward evening of such October days most of the guanayes would be courting, after strenuous hours at sea, during which all their energies had doubtless been devoted to winning the sustenance of life.

Privacy does not enter into their notion of fitness, and while six or seven birds occupy each square yard of ground, the love-making antics are often in full progress. These are in general not unlike the courtship habits of the closely related antarctic cormorants.*

Two guanayes stand side by side, or breast to breast, and ludicrously wave their heads back and forth or gently caress each other's necks. The crests upon their crowns are frequently erected, and the feathers of the nape puff out so that the velvety necks appear twice their normal thickness. Cheeks and chin-pouches continually tremble, and chattering bills are held wide open.

RUNNING THE GANTLET

Now and again one will bend its body forward and at the same time extend the head upside down along the spine and toward the tail, holding this curious, paralyzed attitude for several seconds. Sometimes the birds of a pair snap so much at one another that it is hard to judge whether they are making love or quarreling.

Indubitable quarrels between birds of different pairs also go on without cessation, and occasionally many join in a mêlée. Every now and then, for example, some unfortunate guanay, which seems to be the butt of all bystanders, will go dashing through the throng, holding its head as high as possible in order to avoid the jabs and bites which all others direct at it. If the victim would but stop fleeing, perhaps the blows would cease, but it keeps more and more desperately running the gantlet, flapping its wings, bumping into innumerable neighbors, until eventually it bursts from the vicious crowd into a clear space, shakes itself with an abused air, and opens and shuts its mouth many times with an expression of having just swallowed an unpleasant dose.

FIVE SUITORS SEEK ONE BIRD'S FAVOR

In the early stages of courtship it often happens that several cocks select the same female for their addresses. In one instance, five assiduous suitors, all with necks expanded, were observed bowing around a single hen, which crouched in their midst.

But by no means all the birds are engaged in love-making at every moment, for they spend much time preening their feathers, frequently raising the coverts of the tail and thrusting the bill toward the oil gland. Then, after combing their heads and necks thoroughly with their claws—a real feat in balancing—they promenade in small troupes along the outer edge of the colony.

Visible actions, rather than unusual sounds, alarm the courting birds. A quick motion of the hand will start sudden pandemonium. Even when an observer rises to leave them as slowly, silently, and unostentatiously as possible, a small panic inevitably results, many of the nearer birds beginning to scamper about or to take flight.

On the other hand, the firing of a gun straight into the air produces scarcely a stir, provided the weapon is not brandished. The effect of human conversation is, however, most amusing. Whenever the writer, sitting perfectly still, has begun to talk to the guanayes in a loud voice, a silence has fallen over all the audience within hearing. Their mumbles

* See pages 437 and 438 of the author's article, "South Georgia, an Outpost of the Antarctic," in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1922.

CONDORS BENT ON DESTRUCTION AND SOARING ABOVE THE GUANAY COLONY ON ASIA ISLAND

The great birds, which are ordinarily pure scavengers, have become very definitely birds of prey on the coast of Peru. They make periodical raids from the high Cordillera for the purpose of eating eggs of the guano birds (see text, page 293).

and grunts die away, and they listen for a while as if in amazement.

During the course of a few hours' resting on any island the birds get much befouled with fresh guano, which hardens upon their plumage. They periodically rid themselves of this by flying some distance off the lee side of the island, where they plunge and violently beat the water with their wings.

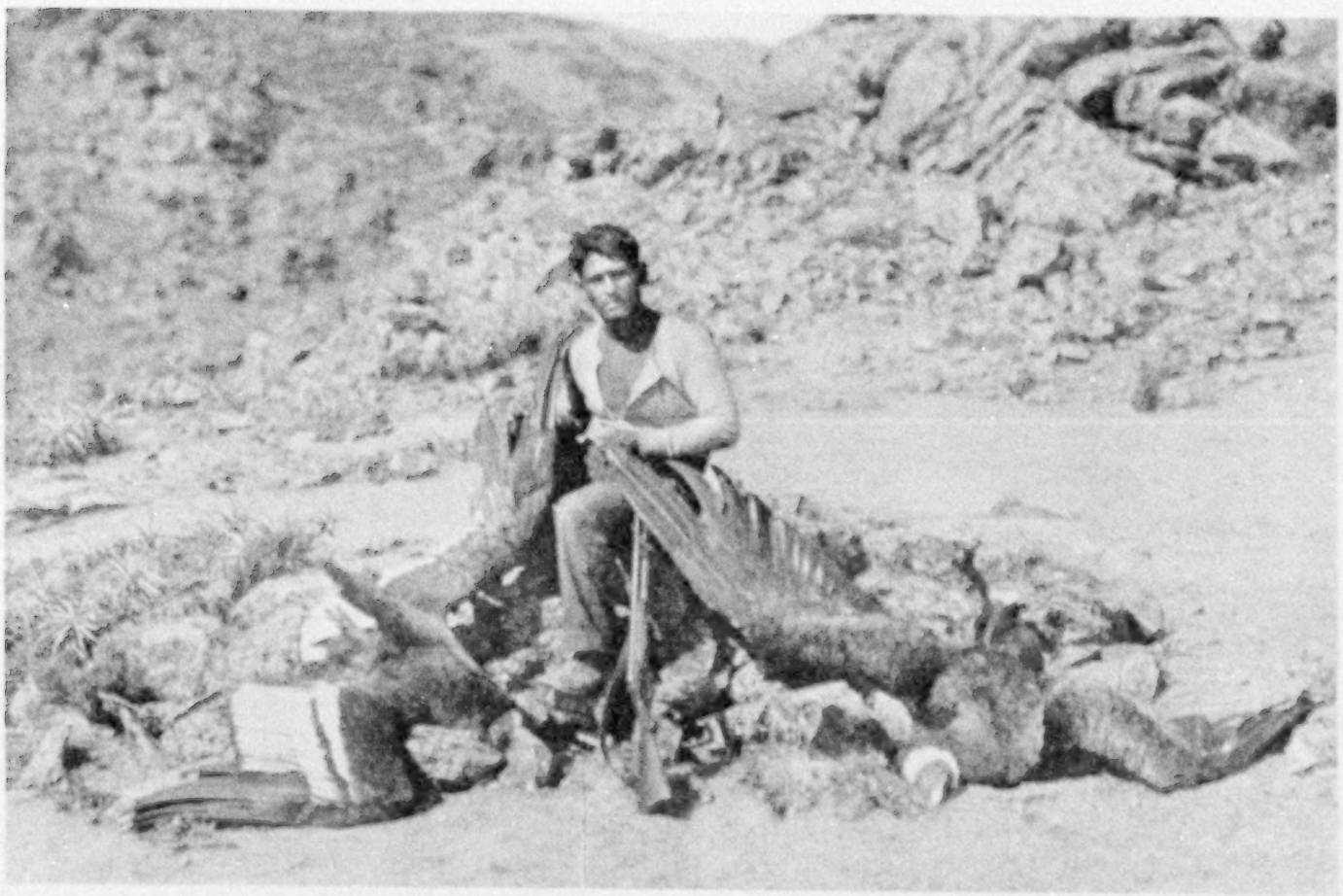
Sometimes most of the inhabitants of a colony will make their toilet in this way at one time, producing a thunderous roar, which can be heard from afar. It is often audible during morning fogs, when the flocks are invisible, and as a boat draws near such a gathering it is easy to mistake the sound for the dreaded crashing of waves upon unseen rocky shores.

HOMEWARD FLIGHT A WONDERFUL SPECTACLE

Inhabitants of the Peruvian coast are agreed that the guanayes never spend the night upon the ocean, as the native pelicans often do, but that they return to their island roosting places even when the journey involves a flight which must continue long after dark. The writer has sometimes watched from 2 o'clock in the afternoon until nightfall, or for about five hours, while they streamed uninterruptedly homeward. A few white gannets (*Sula variegata*) often accompany them, as if filling honorary positions in the line, but fully 999 in every thousand birds are guanayes.

The grandest sight of the day, when the homeward flight is at its maximum, usually comes during the hour before sunset. From some point far away the birds make a bee line for the center of their island, but, as they near their destination, they invariably skirt the shores so as to come down across the wind.

The instinct of following a leader is evidently strong; if, for any reason, a file



A GOVERNMENT GUARDIAN OF THE CHINCHAS WITH TWO CONDORS WHICH HE HAS SHOT ON THE HEIGHTS OF SAN GALLAN ISLAND

Condors rifle the nests of the guanayes and suck the eggs through their trough-shaped tongues (see text, page 294).

is broken, and the rear birds turn toward the left coast instead of the right, those behind will obey the signal and all swing into the new course. Close over gulches and ridges of their home island the oncoming streams of birds flow, the separate "rivulets" cutting across each other like the blades of scissors. At the same time these files also rise and fall in beautiful undulations, which can best be seen from the crest of a hill above them.

Sometimes three or more such lines will flow along for a while 10 or 15 yards apart, but sooner or later one of them will make leeway until two files interweave. Then the soft, humming swish of wings is interjected with sharp clicks as the quills of two guanayes strike together in air. When one beholds the endless mingling, the crossing and recrossing and tangling of the lines, it seems incredible that more birds do not clash (see illustrations, pages 297 and 298).

THE ENEMIES OF THE GUANAYES

It goes without saying that such gregarious creatures as the guanayes must have natural enemies to prey upon their abundance. The sea lions of the coast have been accused of devouring the fledglings when they first take to water, but, so far as the writer's observations go, there is little evidence to support the charge.

The naked, black-skinned, and very ugly chicks, which hatch from rather small greenish eggs, are apt to be thickly infested with feather-eating lice (*Mallophaga*) transferred from the plumage of their parents, and yet, so long as the sensitive nestlings are shielded from the hot sun, they seem to suffer no ill effects from these parasites. Other birds, in fact, appear to be their only serious enemies.

When the writer landed upon Asia Island, off central Peru, on December 4, 1919, great destruction of guanay eggs had been wrought by gulls, turkey vultures, and condors. Although a colony containing countless eggs and young still covered about half of the western slope, extending from the summit almost to the water and filling a deep ravine as well as the rounded hillside, the other half had become a waste of empty nests and

PORTRAIT OF AN INCUBATING GUANAY

Three examples of parasitic flies belonging to a group which lives in the feathers of birds can be seen on the head of this individual.

broken eggshells and had been deserted for the season by the parent birds.

Early in the morning of this day, guanayes were leaving their breeding ground to pour out over the Pacific in an unbroken column, which was following a school of fish in a tremendous sigmoid curve toward the north. The colony was, however, still densely peopled with home-keepers—*i. e.*, the birds of each pair which had remained to cover the eggs or the newly hatched, squeaking chicks (see page 300).

The nests were luxuriantly feathered with molted quills, which, by the way, the brooding birds were forever stealing from one another's foundations. Many walked about carrying bunches of feathers, or flew elsewhere with a bill full.

In the heart of the colony stood a condor, with a small circle of abandoned and rifled nests roundabout. When this pilferer had been shot and picked up by the feet, the albumen and mostly *unbroken* yolks of a round dozen fresh eggs slid out of its gullet. Scarcely any pieces of shell were visible in this rich meal, the supposition being that condors must suck the contents of the eggs through their trough-shaped tongues.

Later in the month of December the guanayes were observed in more advanced stages of the nesting period at the Pescadores and Huaura Islands, to the northward of Callao. Here their robber-enemies were less in evidence, perhaps because the government guardians had been using their guns freely, and few empty nests or broken eggs were noted.

Although a certain proportion of the adults were incubating new sets, the latter probably represented second broods, for the nests were exceedingly large, and the quills which had once formed a lining were now buried deeply under the craters of guano which constituted the rim of each nest chamber. Moreover, nearly full-grown young, in pepper-and-salt plumage, were abundant everywhere (see illustration, page 287).

These chicks were inclined to be indiscreet in wandering away from their own headquarters; whereupon they would presently be chastised by old birds and would have to scurry ignominiously back to their respective home sites.

YOUNG GUANAYES TEASE PARENT BIRDS

Among the larger chicks the approved method of obtaining food was to shiver and plead before their elders until the latter acted as though they were frantic from the teasing. As long, indeed, as the adults were at the nests, the youngsters never let up trying to ram their heads down the parental throats, and it was nothing unusual to see two or even three dive together into a capacious and well-stocked crop

At this season the sound coming from a colony bore some resemblance to an April frog-chorus, for the high-pitched voices of the chicks tended to drown out the mumbling of the old birds.

Still older fledglings had gone down in droves to the quiet rock pools around the shores, where they flapped their wings and dived until they had become proficient in the ways of maturity. Late every afternoon thousands of these apprentices could be seen scrambling up the steep hillsides from their training grounds, striving to get back with the crowd before dark.

Such was their strange indifference to the presence of man that they made no

IN THE MIDST OF THE PRINCIPAL COLONY OF THE PESCADORES ISLANDS

At this time the chicks were mostly full-fledged and nearly as large as their parents.

protest when we picked them up by their pinions and helped them on their way.

FLEDGLINGS INDIFFERENT TO PRESENCE OF MAN

This lack of fear is not necessarily innate. It may be due rather to the familiarity of the birds with guardians who never harm them, an idea suggested during a later visit to an isolated colony of guanayes on the large island of Lobos de Tierra, where both old and young were unwontedly timid and where all the chicks that were big enough to walk left their nests pell-mell at the approach of a human being.

At Mazorca Island, of the Huaura group, a splendid colony of guanayes occupied practically all of the southern or windward slope, from the very brink of low precipices, over which the spray flew, to the crest of the island.

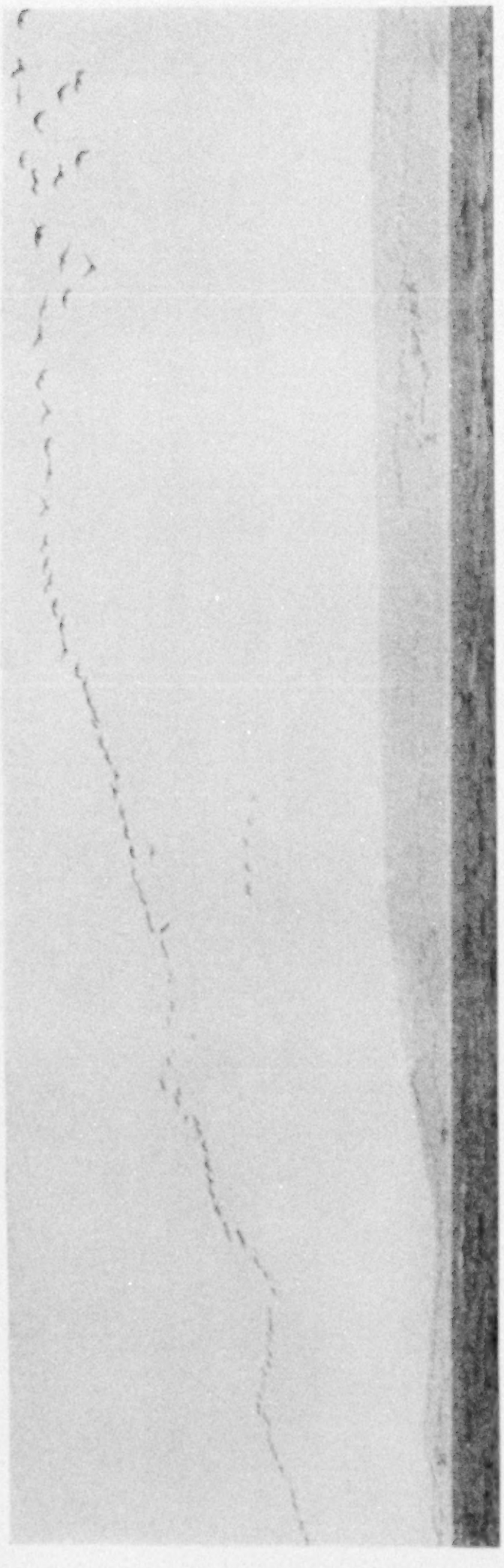
Breeding gannets mingled to a certain extent with the cormorants along the lower border of the nesting ground. A few birds of both kinds had established themselves also on the northern slope, out of the wind, but here their enemies had been active and had succeeded in devouring many eggs.

It seems to be characteristic of the vultures and gulls to attack at the edges rather than in the midst of a colony, and thus they tend to annihilate projecting portions and small outlying groups. Perhaps this is one of the evolutionary factors which have caused the guanayes to breed in such compact hordes.

NO GUANAY MISTAKES ITS NEST

The birds at Mazorca were most tenacious in clinging to their nests, even when a man stepped over them. In late afternoon many of the broods were covered by both parents, which were so huddled together that they looked like single birds with two heads. One usually had a wing, for instance, over the back of its mate. When approached, they bristled all over until their plumage resembled that of Japanese bronze eagles. They would then wave their heads threateningly and hiss with widely opened bills.

In the forenoon the colony usually appeared thin and gray when viewed from the lofty balcony of the lighthouse; but



LINES OF HOME-COMING GUANAYES NORTH OF PACHACAMAC (SEE TEXT, PAGE 283)

by 3 o'clock in the afternoon it would be black, owing to the return of tens of thousands of additional birds. Before alighting, most of the homecomers soared back and forth considerably in the fresh breeze.

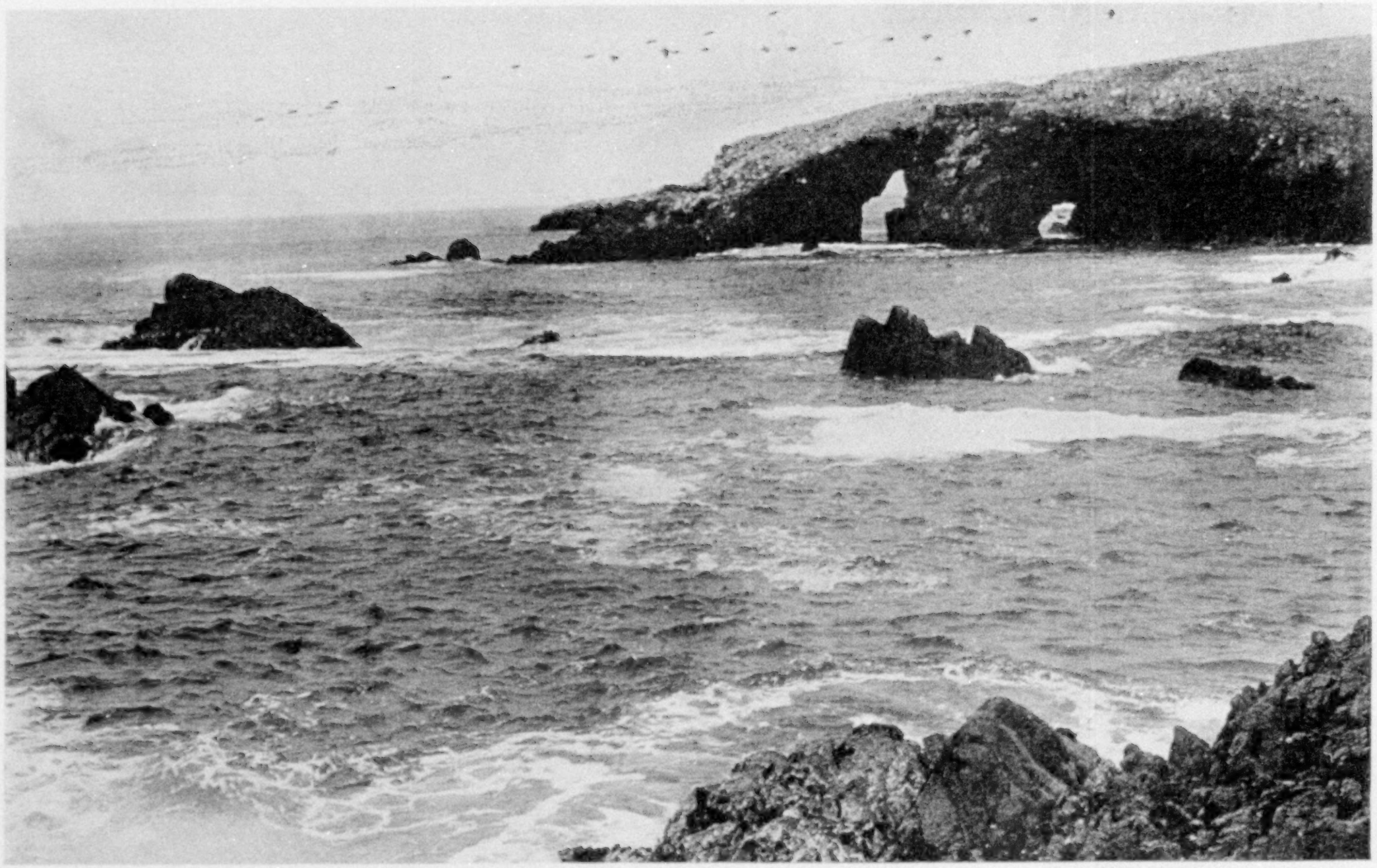
Whenever one came to earth in the wrong place, it would immediately disclose its mistake by what can only be called a "lost" expression. Other guanayes in the vicinity would grasp the situation at once and would then assault the newcomer, forcing it to take wing again at much sacrifice of dignity. It was a genuine misfortune for birds to alight where they were not welcome, for they seldom got off without being thoroughly pecked and jabbed.

Such extraordinary reactions answer the question, so often asked, as to whether colonial birds always find their individual homes among myriads of seemingly identical nest-hollows distributed over acres of undifferentiated surface. Above all else, Nature jealously guards the unity of the family; each mated pair must fulfill its own obligation of rearing offspring to maturity, and every unconscious tendency to depart from this responsibility is nipped in the bud.

PERU ENFORCES WISE CONSERVATION POLICY

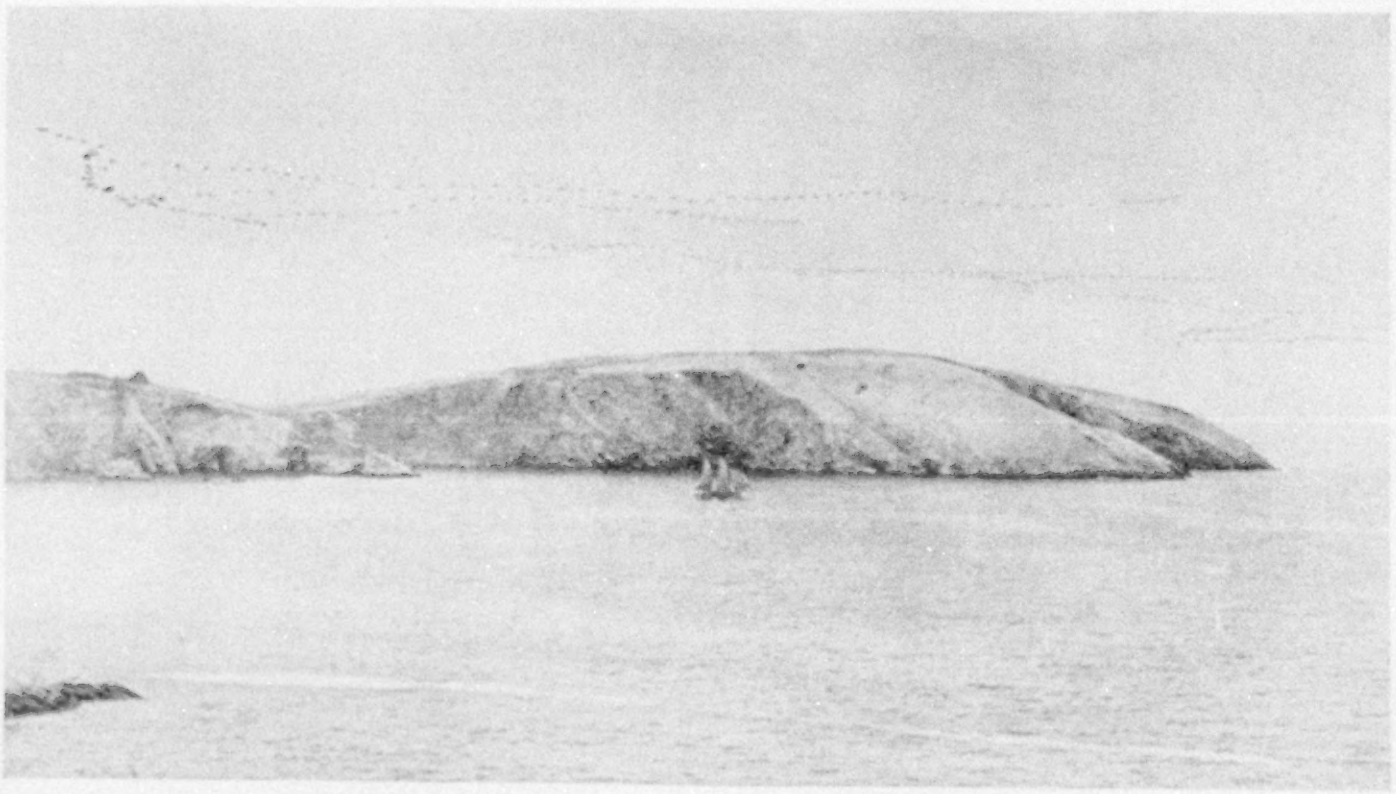
The guanayes have not always had the freedom from disturbance which they now enjoy along the whole length of the Peruvian coast. Dr. Coker has described the decades of mismanagement which ended in the exhaustion of the ancient guano deposits and in such a vast reduction of the insular bird life that the future of the national agriculture was seriously threatened.

The rehabilitation of guano traffic, the conversion of an exploitation into a true industry, the repopulation of the barren rocky islands with colonies of birds whose numbers may be compared with those of the flocks protected by the aboriginal Indians, and the building up from the wreck of the past of the greatest of all business enterprises based upon the conservation of wild animals, make an inspiring story of modern Peru.



FEATHERY LINES OF GUANAYES RETURNING TO THE COLONY ON NORTH CHINCHA ISLAND

Such formations are very beautiful to watch, but difficult to bring out in a photograph.



HOMEWARD-BOUND GUANAYES, IN CHARACTERISTIC WHIPLASH FORMATION, ABOVE CENTRAL CHINCHA ISLAND (SEE TEXT, PAGE 292)

In the short space of fifteen years the larger part of the change has been accomplished. The contract system of guano extraction, with its cutthroat competition and waste, has been abolished, and control has been centered in a National Guano Administration, the policy of which makes immediate advantage secondary to a rigid protection of the birds upon which future resources depend.

Credit for the reorganization belongs in the main to the farsighted and patriotic citizens of Peru who succeeded in pushing through, against odds, the necessary legislation, but the influence of foreign investigators, such as Dr. H. O. Forbes and Dr. Coker, must by no means be overlooked.

The first undertaking of the National Guano Administration, under the able directorship of Señor Francisco Ballen, was to make each of the numerous guano islands a bird sanctuary, closed at all seasons of the year to unauthorized visitors.

Competent guardians, with duties scarcely less exacting than those of lighthouse-keepers, were posted as permanent residents upon every group.

Clandestine guano extraction, the stealing of eggs for food or for the use of the albumen in clearing wine, and other depredations which had formerly caused havoc in the colonies, ceased at once. The old method of extracting guano without regard to the presence or condition of the birds has, of course, been abolished.

The islands, under the new rule, are worked according to a system of rotation which leaves ample and congenial breeding grounds always available. Courting or nesting birds are shielded with particular care.

Moreover, after removal of the guano, an island is promptly vacated and is thereafter given over to the complete possession of the birds for a period of approximately thirty months, at the expiration of which the date for a renewal of digging operations is determined only after thorough reconnaissance.

ANNUAL OUTPUT OF FERTILIZER INCREASES FROM 25,000 TO 90,000 TONS

The creation of a technical section of the Guano Administration, in charge of an agricultural engineer, Señor J. A. de Lavalle y García, has resulted in important scientific work upon the islands, including meteorological and zoölogical investigations, and a detailed study of diseases of the birds. The same department has also conducted a progressive

GUANAYES OF THE CHINCHAS DURING THE COURTSHIP SEASON, BEFORE THE BIRDS HAVE SELECTED SITES FOR THEIR NESTS

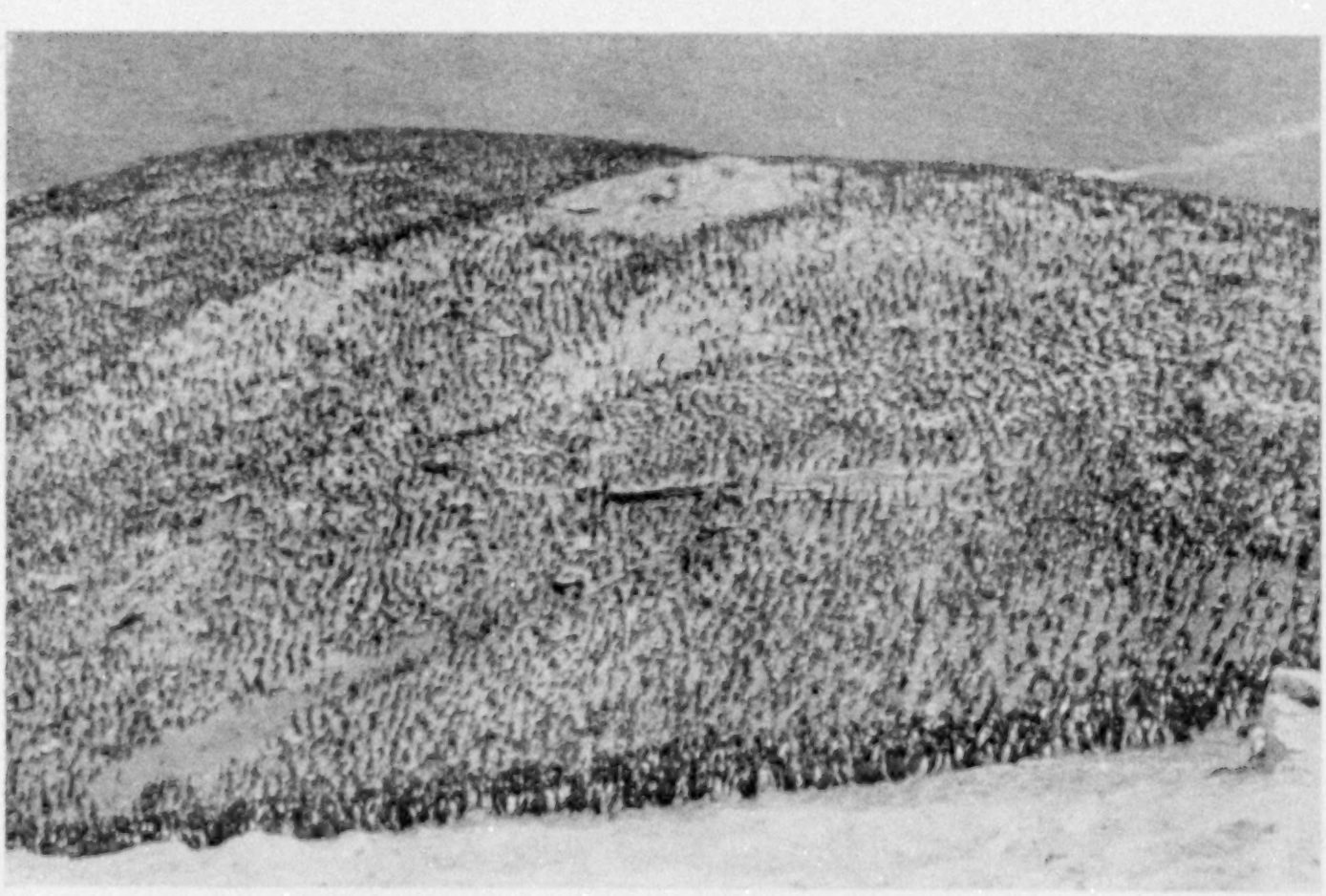
They are all panting because of the extreme heat of the sun reflected from the guano-covered surface.

HAVOC CAUSED BY CONDORS IN THE GUANAY COLONY ON ASIA ISLAND

This dead city of guanayes extended over many acres, the condors and other rapacious birds having devoured the eggs and newly hatched chicks in thousands of nests (see text, page 293).

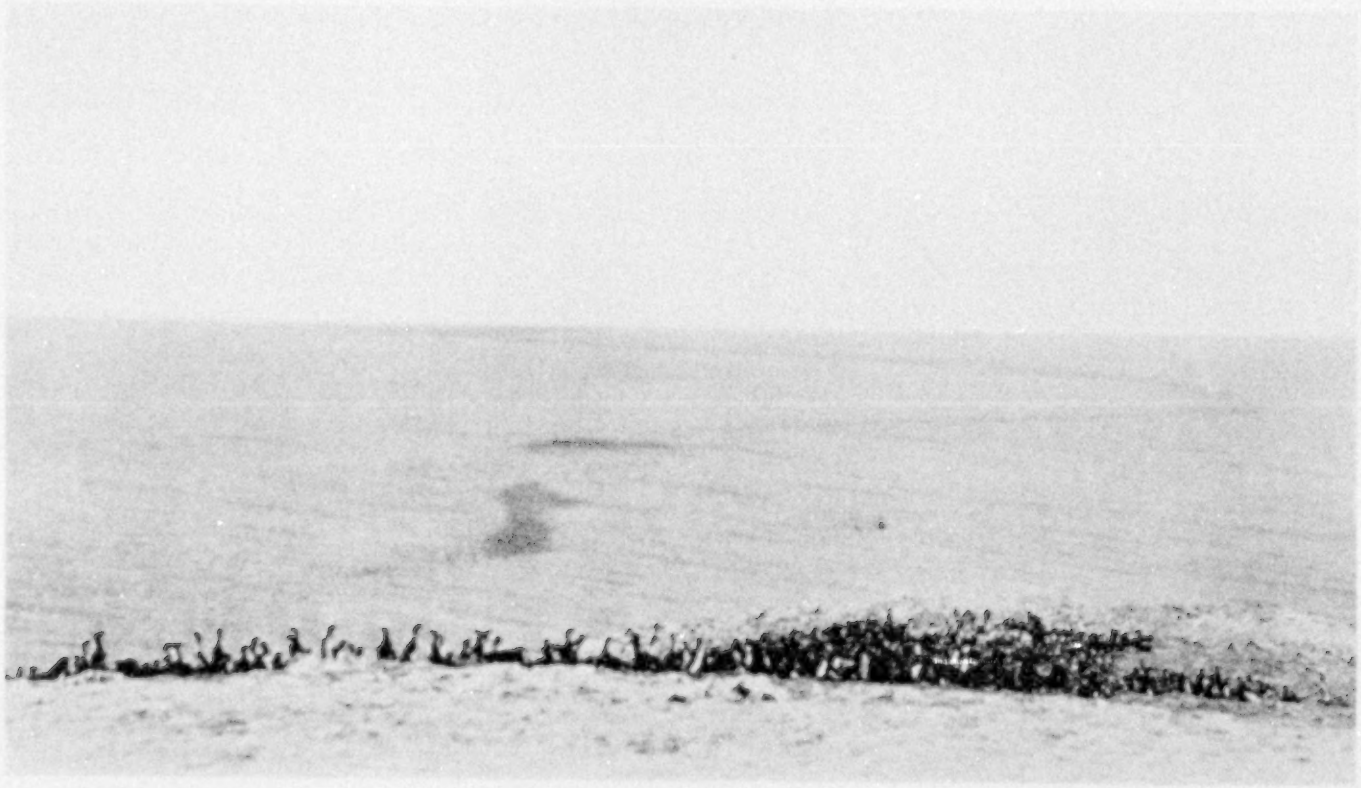
CENTRAL CHINCHA ISLAND IN MID-AFTERNOON, WHEN THE GUANAYES ARE BEGINNING TO SETTLE AND TO SPREAD OVER ITS SURFACE

Dark masses of birds can be seen on the summit of the hill.



THE HOME-KEEPERS: PARENT GUANAYES PROTECTING THEIR NESTS

This is part of the colony on Asia Island during the middle of the day, when the other half of the nesting birds was away at sea. These guanayes guard the eggs and young birds from their enemies and from the heat of the sun (see text, page 294).



GUANAYES ON ASIA ISLAND AT ABOUT THE HATCHING DATE OF THE YOUNG BIRDS: ADULT BIRDS ARE SEEN STARTING TO SEA

The long, hook-like file stretches out for a distance of some two miles over the quiet Pacific.

DEAD GUANAYES COLLECTED BY THE GUARDIANS AT CENTRAL CHINCHA ISLAND

These birds represent not the result of an epidemic, but merely the normal mortality in a colony containing several hundred thousands of birds. In order to prevent the possible spread of infection, the dead guanayes are heaped up in this way, saturated with oil, and burned.

A FLOURISHING COLONY OF GUANAYES ON SANTA ROSA ISLAND, INDEPENDENCIA BAY

advertising campaign in order to make the value and availability of guano familiar to planters throughout the Republic.

The regime of the National Guano Administration, with its well-balanced regard for both business and conservation, has resulted in a nearly uniform growth in the increment of natural fertilizer. Ten years ago the annual output was less than 25,000 tons, while to-day it is about 90,000 tons, of which 70,000 tons are used in Peru and the remainder exported.

Even to-day's figures may seem small when compared with the many million tons of guano shipped from the Peruvian islands during the latter half of the nineteenth century. But the old exploitation only drew upon the deposits of past ages, with a constantly diminishing return, while the new method builds up its future as it goes.

The guanayes, as well as birds of lesser importance, are rapidly repopulating the ancestral breeding grounds.

Unless quite unexpected circumstances intervene, it is probable that the impressive, streaming flocks, which alone connote a healthy and productive condition of the guano-making colonies, may always be seen along the famed seacoast of the Incas.

ZIGZAGGING ACROSS SICILY

By Melville Chater

Author of "Through the Back Doors of France," "East of Constantinople," "The Land of the Stalking Death," etc., in the National Geographic Magazine

THE train-bearing ferryboat floated our Naples-to-Messina section across the straits to Sicily. Behind us, on the Calabrian coast, rose Scilla's castle-crowned promontory. Ahead lay the vast curve of Messina (Zancle—that is, sickle, as its early inhabitants named it), of old the landmark of Charybdis' fabulous whirlpool, "which thrice daily sucks down water and thrice vomits it forth."

"Whirlpool?" repeated the ferryboat captain, to whom we had quoted this bit of Homeric lore. "Well, we Sicilians call it *garofano*" (carnation). "The strait's irregular currents, together with their bastard currents—those running in the opposite direction—cause some half-dozen vortices hereabout. Look yonder!"

He pointed to a rotating patch of water whose circular shape and flicked-up surface sufficiently suggested an enormous carnation. Two fishermen, manning a light craft, were breaking their backs to avoid the suction. Presently another current caught them, and they were literally rushed across the strait toward Calabria. They had been caught unawares "between Scylla and Charybdis."

We had identified Homer's whirlpool!

But what of his voracious sea monster, "with twelve dangling legs," who squatted in a sea-cave under Scilla's promontory, devouring sea-dogs? It was Messina's fish market, aswarm with polypi, with their multiple "dangling legs," which gave us the clue. Some early Greek sailor's yarn, plus a poet's imagination, might easily account for Scylla.

AN ISLAND RICH IN MYTHICAL LORE

But exit romance! For nowadays Scylla, the devourer, is chopped up, stewed in her own sepia, and consumed by Sicilian epicures.

At least, one must be prepared to swallow Greek mythology—a much pleasanter dose—if one would understand modern Sicily.

We accepted point-blank the myth-makers' statements that Cronus and Zeus inhabited this three-cornered island of Trinacria—as the early Greeks named it—during the Golden Age; that Athene dwelt on its northern coast, Artemis at Syracuse, and Ceres at Enna; that Dædalus, of waxen wings fame, flew hither on his non-stop flight from Crete. Hercules left on Sicily the huge "footprints" which we may conjecture were earthquake fissures. Ulysses, sailing up its eastern coast, was captured by the Cyclops just north of Catania. And still to-day the little Sicilian shepherd boy hums century-old tunes to his nibbling flock, unconscious that his art sprang from Daphne, the resident muse of pastoral poetry.

SCENE OF AN EARTHQUAKE WHICH COST MORE THAN 77,000 LIVES

As our train crawled upward and around Messina's sickle curve we glimpsed the roofs of the modern town, rising over the former site, which was earthquake-shattered in 1908. Though there are still vast nude spaces of the artificially prepared basis upon which the city is being constructed, some 80,000 people occupy the red-roofed stucco houses of uniform design, government-built, at a cost of $6,000,000.

The catastrophe of 1908, beginning with a 35-second shock and lasting with intermittent vibrations throughout a month, affected an arc-shaped zone* 18 miles long and 12 miles at its greatest breadth. The accompanying tidal wave engulfed both coasts of the strait, obliterating the Sicilian shore line for 60 miles. Ninety-one per cent of Messina's buildings were destroyed, and of its 120,000 people 77,283 perished.

In the new Messina one's house must not exceed 23 feet in height and one's garden must attain a certain proportionate maximum. It is a safety-first city—low, wide, well spaced—which exceeds its former total area by 50 per cent and its

* See "The World's Most Cruel Earthquake," in the National Geographic Magazine for April, 1909.

© F. Gallí Crupi

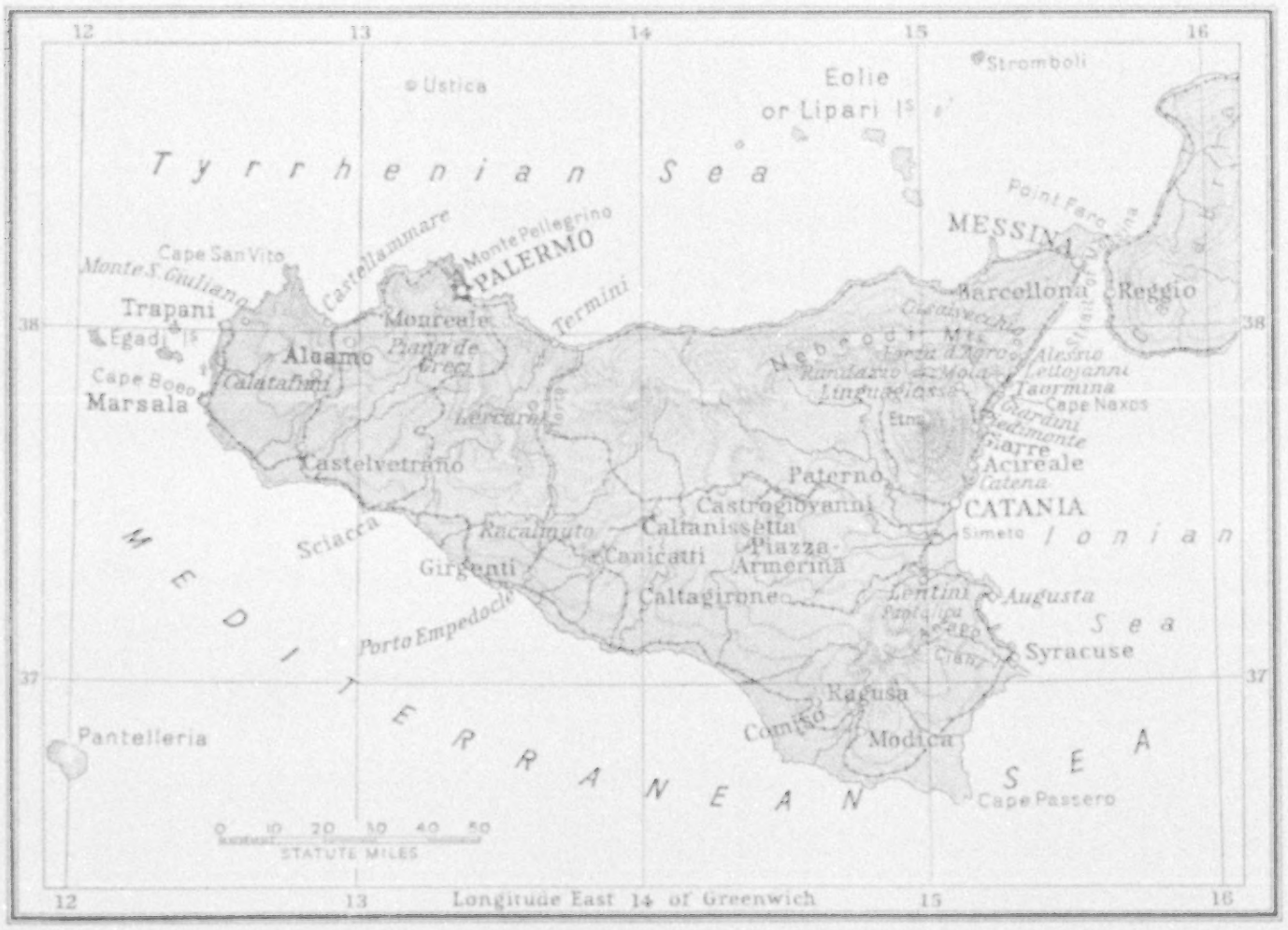
SICILIAN GIRLS WORKING ON THEIR "HOPE CHESTS"

Nearly every Sicilian woman learns when she is quite young how to spin and weave cotton cloth. Many of the girls make cloth to sell, and weave special pieces at odd moments for their dowries. Until recent years, they wove all the clothes for the family and the bed linen as well. During the American Civil War, when the supply from the United States was cut off, cotton was grown abundantly in the southern districts of the island.

Photograph by A. W. Cutler

GOSSIP HOUR

With the exception of mining and deep-sea fishing, most of the industries of Sicily are connected directly or indirectly with agriculture. These women, for example, belong to the numerous army of housewives engaged in preserving vegetables in tins, especially tomatoes and artichokes. Millions of cans are shipped annually from the island to the Italian mainland and to South America.



Drawn by Charles E. Riddiford

A SKETCH MAP OF SICILY

The fertile island at the toe of the Italian boot has less than one-fifth the area of Cuba, but it has a million more inhabitants than the island republic.

former open-space area (streets, gardens, and squares) by 55 per cent.

"EXCURSION RATES" MEAN HIGH RATES IN SICILY

The initial lap of our 500-mile zigzag across Sicily lay along the sea-skirting railway to Cape San Alessio, and from thence, afoot, by a mountainous detour, to Taormina.

Our first encounter with the unexpected, that bright Sunday morning, was our discovery that, instead of announcing "reduced fares for week-end trips," Sicilian railways actually augment their tariffs on Sundays and feast days. As Sicily enjoys over eighty *feste* annually, the church calendar thus becomes a distinct factor in railway earnings.

Our second surprise was to find that what our maps showed as a river, descending the mountains near Cape San Alessio, consisted of a bone-dry bed, two-thirds of a mile wide, and well worn into paths, down which ambled donkey trains laden with sacks of lemons. With but few exceptions, the score of streams which head declivitously toward Sicily's 422-mile coast line, remain these dried-up *fiumare* for the greater part of the year. And so, lacking roads, the Sicilian mountaineer—who is an adept at wringing advantages from Nature—uses the fiumare as very serviceable thoroughfares.

Up the arid river course we toiled to higher levels where cement irrigation sluices, arush with water, laved outstretched terraces of lemon trees, under which sat peasant pickers classifying the yellow fruit. The miracle of cunning whereby the Sicilian, in his almost unwatered land, drills deep to the earth's secret springs, thereby irrigating some ten million orange, lemon, and citron trees, rivals Moses' rock-smiting performance in the desert.

Crowning a near-by height stood a twelfth-century Norman church, its crenelated walls constructed partly of lava blocks. Deserted and denuded, it

Photograph by Melville Chater

PUPILS OF A LACE-MAKING SCHOOL IN SICILY

Photograph by F. Galifi Crupi

BOYS DANCING THE TARANTELLA

The lively movements of this impassioned dance of southern Italy and Sicily formerly were believed to be a panacea for the bite of the tarantula, or large European wolf spider. An epidemic of melancholy madness ending in frenzies and death, which once afflicted the women of Apulia, was attributed to this insect.

Photograph by A. W. Cutler

A SICILIAN CART WITH RELIGIOUS PICTURES PAINTED ON THE BACK PANELS AND HISTORICAL SCENES ON THE SIDE PANELS

This vehicle, known as the *carretta*, is used both for passengers and freight, and is often painted in the most vivid contrasting colors (see text, page 346).

MUSEUM

Photograph by Alinari

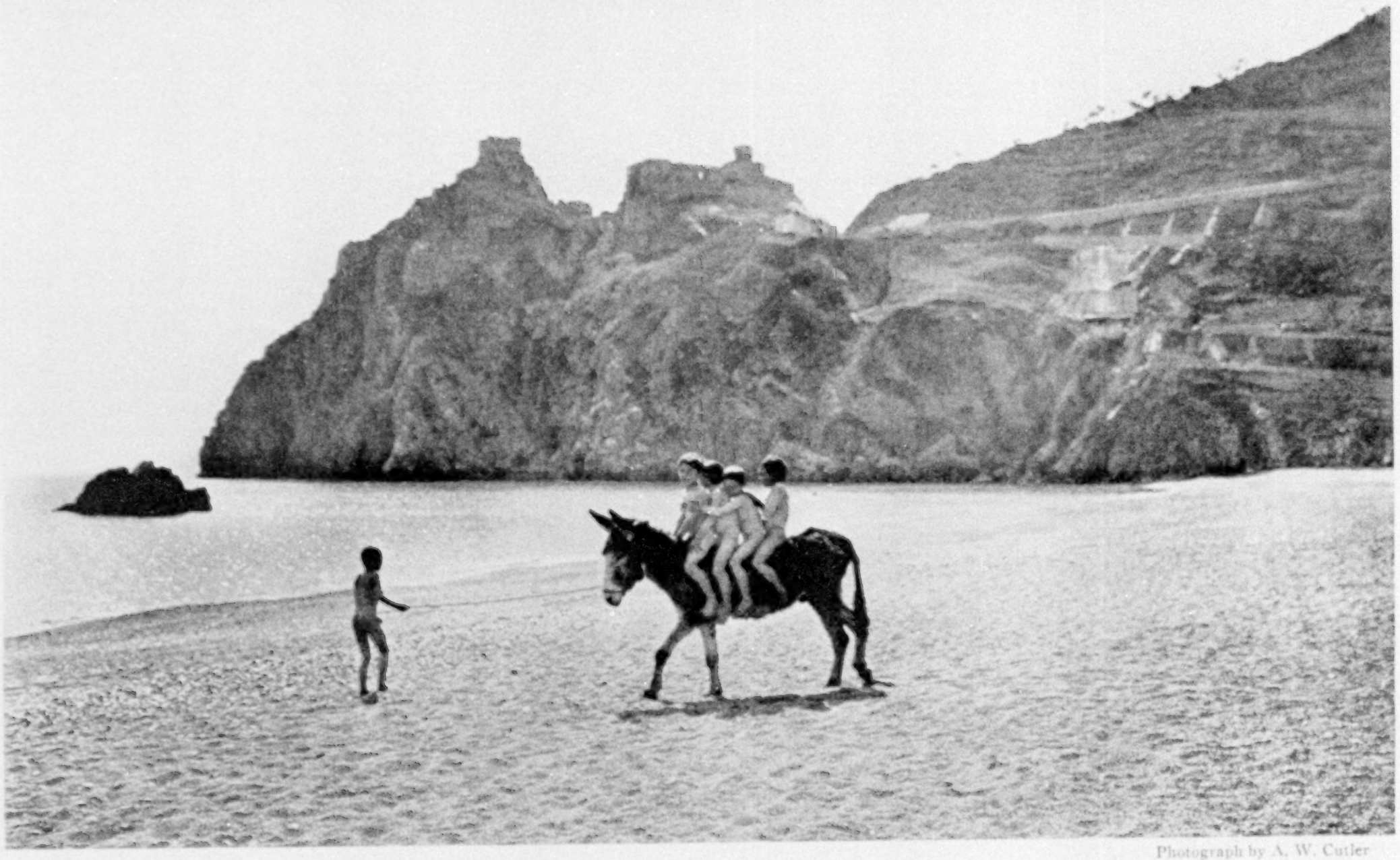
A VENDER OF NATIVE POTTERY AT MESSINA

The jars have a biscuit-colored background with red and blue decorations.

Photograph by A. W. Cutler

A SICILIAN SHEEPSKINS MERCHANT PEDDLING HIS WARES

In the homes of the very poor skins often constitute the only bedding.



Photograph by A. W. Cutler

SICILIAN BOYS AT PLAY BENEATH THE ANCIENT TWIN CASTLES OF CAPE SAN ALESSIO (SEE MAP, PAGE 306).

represented to us the first incursion of western Christianity into an island which had been successively ruled by Greeks, Romans, Vandals, Goths, and Saracens.

A VILLAGE SET ON A CRAG

Following mere donkey trails, we climbed on, at last finding ourselves at Casalvecchio, dizzily set on a crag, 1,200 feet above sea-level. In its remoteness, its magnificent encirclement and its appalling filth, it was typical of a hundred heaven-kissing Sicilian mountain towns.

No street was horizontal. There was nowhere to go but down, nowhere to return but up. There were only two occupations, and doubtless these had been carried on ever since Theocritus, a native of Sicily, wrote idyls on them; the boys were herding sheep on the mountain side, the women were carding and spinning at their doorways (see page 304).

The Madonna was not forgotten at the tiny wayside shrines, where votive cornflowers clustered about her feet.

The downhill streets constituted the sewerage system. Also, as the straw-spread cobbles indicated, one's cattle bedded themselves before one's front door. Hercules, who cleansed the Augean stables, would have fled affrighted. We stepped out of the ankle-deep morass and caught breath in a doorway.

"Why don't you clean your streets once in awhile?" I asked of a passer-by. At this revolutionary idea he tilted his curious, baglike cap, scratching his head.

"If we did, *signore*," he replied, "we would only have to clean them all over again after another four or five years."

On the town's farther brink stood a woman screaming raucously in the direction of her absent son, whose replies came with perfect distinctness from a mile or more away, across the valley. Due to the clear air, this "broadcasting" carries over incredible distances; and the habit probably explains why a friendly, face-to-face conversation between two east-coast Sicilians sounds like a clash of infuriated yells.

We descended the mountains and followed the sea coast to Letojanni. The long, sun-baked street revealed the café, with its parcheesi-playing fishermen, the provision shop, with its stockfish, macaroni, and loops of Bologna sausage, and the many doorways where sat mothers at the Sicilian spare-time avocation of searching their children's heads.

Black-eyed youngsters, their lips stained purple with the fruit of the cactus, screamed nasal gibberish at us, in imitation of the American speech. Wickedly they handed me a cactus apple, shrieking with delight when I found my mouth stinging with the almost invisible spines which clothe that fruit of the devil.

IN A LEMON FACTORY

Near by heaps of lemon rinds, rising to the height of small haystacks, suggested the remains of some mammoth Sunday-school picnic. They proved, however, to be the refuse of one of the many citrate factories which dot the Sicilian coast. This particular factory hummed with the industry of several hundred boys and girls, who sat at long benches plying knife or sponge.

With a stroke the lemon is halved, then, with two more flashes of the specially adapted knife, the meat in the two halves is hulled clean. This is crushed in a press, the juice being piped to vats, where, after due condensation by boiling, it is mixed with slaked lime. The product is then baked, issuing as slabs of citrate of lime, for shipment to the world's chemical factories.

Pinch the skin of a freshly plucked lemon and atomized jets, deliciously fragrant, will spurt forth. This essence, known as lemon oil, is extracted by pressing the emptied rind with a sponge in a wooden bowl. A workman can press out per day about 1½ pounds of essence. It is then canned and shipped abroad for use in the manufacture of perfumes and liqueurs. The exhausted rind is used locally as cattle fodder or fertilizer.

In the provinces of Messina and Catania 600,000,000 lemons are an average crop, about one-fourth of which is used in the citrate factories. The manufacturing season lasts from November to May, and during that period the Letojanni factory reduces more than 17,000,000 lemons to citrate and essence.

We pushed on to Giardini, where food-tax dodgers, who had been shopping in Messina, were descending from the train with camouflaged cabbages and disguised fish. Sicilian municipalities still jealously

Photograph by A. W. Cutler

PLAYING THE "CERAMELLA" BEFORE A WAYSIDE SHRINE AT CHRISTMAS

From morning until night during the thirty days before Christmas these pipers trudge through the ill-paved streets and roadways to play before the many shrines near their homes. Every night the small lantern on the left of the shrine is lighted (see text, page 317).

guard their ancient system of intertown taxation, which harks back to centuries when each city was a sovereign state with cutthroat designs against its neighbor.

As we stood looking up at Taormina, cliff-perched 650 feet overhead, we were accosted by a ruffianly looking hack driver. Notorious as is the Sicilian's brutality toward animals, this individual completely disarmed us and as completely forestalled his yelling competitors. "Americans?" he inquired, with a smirk, "You take me. I good S. P. C. A. boy." And he proudly showed us a membership card of some Sicilian branch of that organization. Of course, we took him.

I regret to state that, as we subsequently heard, Giuseppe had stolen this card, and was corralling the American tourist trade on the strength of it. But one night, in a disastrous card game, he gambled it away as his final asset, whereupon the winner, a rival hack driver, captured the tourist trade and Giuseppe went broke.

TAORMINA'S UNRIVALED SITUATION

Taormina, tourist-frequented, crowns the most majestic height on the Sicilian coast. On one hand its green flanks, clad with olive and almond, plunge dizzily downward into far-flung vistas of white seashore and castle-crested promontories. Outward the eye-sweep lingers upon the blue lotus dream of the Ionian Sea, where far Calabria glimmers opal-like against the horizon. And, on the other hand, a yet greater panorama of shore line stretches in a vast scimitar-curve to where lifts inland the long, sky-cutting slope toward its dazzling culmination—snow-crowned Etna (see pp. 318, 319, and 320).

At Taormina's back doors rise mountains and yet more mountains; and when some plodding donkey has borne you up these heights you would need an airplane to cross the precipice and gain the peaks beyond. Yet everywhere, with infinite labor, peasants' hands have terraced the steeps with lemon orchards, whose rich yellow gleams distantly under the smiting sunshine.

From the town's seaward-facing plaza may be descried the bare cape of Naxos, that Plymouth Rock of the first Greek colonists, who landed there in 735 B. C. Taormina's byways reveal a once beautiful Greek theater, over-botched with Roman brickwork, Saracenic tombs, and a Gothic palace used as a tenement house, while its overhanging heights are topped by the ruins of a Sikelian castle.

FIFTEEN NATIONS HAVE HELD SICILY IN 3,000 YEARS

This array of nationalities leaves one rather out of breath. Briefly, fifteen nations have occupied Sicily during 3,000 years, their respective rules lasting anywhere from a generation to five centuries.

In antediluvian times Sicily was the bridge—and to-day it is still the stepping-stone—between Europe and Africa. It lies but 90 miles off the Tunisian coast, while the strait, at its narrowest, interposes a bare two miles between Messina and Italy. Naturally, then, Sicily's two earliest peoples, the Sikanians and the Sikelians, were respectively of Libyan and Latin origin.

The Sikelians have left pottery, bronze ware, vast amphitheaters of cave tombs, and a race name which, slightly modified into "Sicilian," has endured for 4,000 years.

The Phœnicians—those business-as-usual ancients—started trading posts on Sicily about 1000 B. C. Two centuries later they were ousted by the Greeks, who, having enslaved the Sikelians, settled down for a 500 years' stay. The successful Greek generals threw off allegiance to the mother country and kinged it as "tyrants"—a title not originally synonymous with misrule—over the Sicilian city-states.

Out of Africa swarmed the hosts of Phœnician-founded Carthage. After 125 years of warfare Sicily called in Rome, who ousted the Carthaginians and thereafter ruled the unfortunate islanders for five centuries of such oppression that twice the very slaves rose in armed revolt.

For another hundred years the island was plundered by Goths and Vandals, then Constantinople, capital of the Eastern Roman Empire, reclaimed it for an ever-weakening sway of three more centuries.

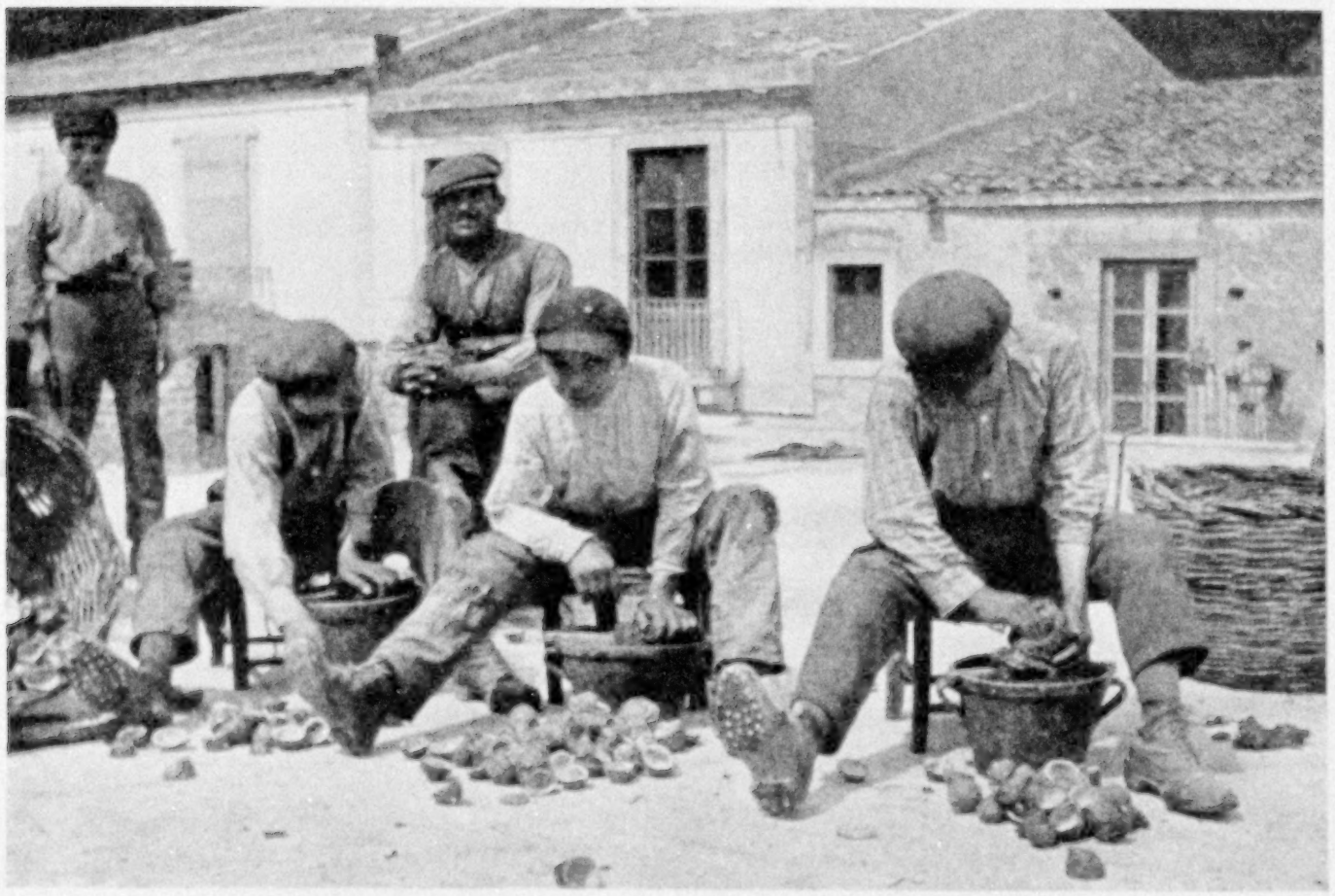
Out of the East swept the whirlwind of Mohammedan conquest, and for two centuries Sicily lived under Saracen governors. Their benign rule, to which the island owes its silkworm culture and

XUM

Photograph from H. T. Cowling

GATHERING FRUIT IN A LEMON ORCHARD OF SICILY

Extension of the lemon groves of California has done much to paralyze one of the greatest industries of Sicily, but within recent years the natives have been able to recoup their fortunes by using a large portion of their crop in the manufacture of citrate of lime.



Photograph by Melville Chater

PRESSING LEMON RINDS TO EXTRACT THE ESSENCE, AT LETOJANNI, NEAR TAORMINA

The lemons are cut in half and pulped by one quick motion. The juice pressed from the pulp runs into tanks and is boiled with powdered lime rock. When the fluid is drained off, the soft gray residue is spread on shelves in a drying room and the citrate of lime is ready to be packed for exportation. From the rinds lemon oil is extracted for use in the manufacture of perfumes and liqueurs (see text, page 311).

irrigation, ended in a bloody sect warfare wherein they "suicided" their own dominancy.

Next, the ten stalwart sons of Tancred de Hauteville, gentleman of Normandy, chief of whom were Robert Guiscard and Roger, wrested Sicily from the infidel and founded a kingly line, which, after a century and a half of wise rule, left such splendid medieval monuments as the Palatine Chapel at Palermo and the Cathedral of Monreale (see page 345).

GARIBALDI BRINGS DELIVERANCE

From the thirteenth century downward, Sicily's history, especially during the Spanish Bourbons' régime, is one long story of misrule over a wretched, half-enslaved people.

At last, in 1860, deliverance dawned. In six weeks Garibaldi, with his 1,000 volunteers, stormed and took Palermo, ousted the foreign tyrants, and turned Sicily over to the Italian Crown.

From such a history of age-old exploitation and race mixtures emerges the modern Sicilian. Upon his island's 10,000 square miles—less than one-fourth the area of Cuba—has poured wave on wave of peoples, none of which has been so overwhelming as to fix an enduring type. Sicily's history has never been that of a single, evolved nation; rather it has been that of a melting-pot in which the racial elements have never completely melted.

Here, for example, are two small sisters at play. The one has fair skin, yellow hair, and blue eyes, while the other is swarthy, with eyes and hair coal black—the Norman and Saracenic types, still unassimilated after seven centuries. Small wonder if the game breaks up in a free fight!

And here is a Saracenic drama in one act. Enter Leah, a Sicilian domestic, irrupting into the sacred tea hour of a resident English family, a turkey-red bandanna on her black hair, a parrot-green shawl over her superb shoulders, great gold hoops in her ears, and with gouts of

Photograph by A. W. Cutler

LEMON-CARRIERS OF SICILY

When a lemon plantation is situated close to a village, the fruit is carried to market in baskets by women and girls. On the return for a fresh load, the baskets are "worn" as shown in the photograph.

blood streaming from a gash in her neck. "Concetta tried to kill me," she announces, more in fury than in distress. "My brother betrayed her sister, so Concetta waited in a dark street and gouged me with a sharp stone."

Failing to get your enemy, get his next of kin. It is a Sicilian dictum which works both ways. And I dare say that soon after, Leah's lover stabbed Concetta's brother in the back.

THE SICILIAN ENACTS HIS RELIGION

Until the melting-pot melts, the Sicilian will remain a primitive being. At the stir of love, revenge, or religion—those three root instincts—he overleaps mere thought into soul-satisfying action. Even his religion he does not merely think or feel; he must enact it. Christmas, Passion Week, and Easter are to him the names of three gorgeous dramas.

The Christmas drama is charming. For days each family has been preparing a Nativity shrine consisting of a wooden tray, green with the fresh turf, upon which are arranged toy cattle, a naked baby doll, a miniature grotto, and surrounding candles. At dusk, one week before Christmas, these trays are set forth in shop window and open doorway, their lighted candles aflicker through the narrow, darkening street.

Here comes the bagpiper! Over and down the hillsides resounds his ever-nearing melody, till presently he appears in mid-street, to pipe the *pastorale di Gesù bambino* before each little Nativity shrine. Over and over it is played, twilight after twilight, until, at the week's close, every shrine in doorway or shop window has received homage (see page 312).

It is unforgettable, that moment of suspended trade—the shopkeeper with uncovered head, his wife nursing her baby, the street urchins huddling awed at the doorway—when the piper, facing the lighted shrine amid homely vegetables or groceries, pipes of angels, shepherds, and adoring kings.

A grave, sweet, Haydnesque measure, instinct with the hovering of angelic hosts, opens the pastorale. There follows a folk-dance lilt, announcing the joyous approach of shepherds. Then the crescendo dies, the grave, sweet strain resumes, diminishing, and you seem to hear the adoring pageant pass over the hills and away. Such is the Sicilian pastorale, a folk melody of uncertain age, transmitted orally from generation to generation of the unlettered peasants who pipe it among the Taormina hills.

But music is not enough; the town is visited by a Christmas epidemic of the tarantella. In café and open street quaintly clad fisher boys, wearing goatskin sandals and the Sicilian liberty cap, and paired with girls who have donned their grandmothers' *festa* dresses, caper madly to the mandolin's jig tune.

Passing couples, as if bewitched, fall into the same tarantella step. A grandfather and his grandson are doing it in mid-street. An old, gray-haired man and woman, with a mutual memory of seventy-odd Christmas tarantellas, are skipping it rheumatically in a secluded corner. Truly, the whole town seems dancing mad—tarantula-bitten, says the legend which names this wild reel after the venomous insect (see page 307).

On Christmas Eve an effigy of the Holy Babe, preceded by three natives attired as the Magi and followed by church dignitaries heading a concourse of citizens, is borne, street by street, through the entire town, to a square where blazes a mammoth bonfire. Bursting bombs rend the air and spectators embrace each other at sight of the effigy, exclaiming, "Christ is born!"

Then, to the garish accompaniment of pinwheels and red fire, the waxen *bambino* is brought to the cathedral, where a youth, symbolizing the boy Christ, preaches a sermon. At 2 a. m. you go home to bed, feeling that you have witnessed a clash between a medieval mystery play and a Fourth of July celebration.

THE PASSION WEEK DRAMA

The Passion Week drama starts on Maundy Thursday afternoon, when an image of the Holy Mother, with daggers piercing her breast and the crucified Christ across her knees, is borne through the town and deposited in a church Next afternoon a white-draped, white-masked band, suggestive of the Misericordia, solemnly defiles through the town's main street, bearing a glass coffin which contains a life-size effigy of the Christ, extended on a bed of spring flowers.

XUM

TAORMINA, ON THE EASTERN SHORE OF SICILY, WITH ETNA IN THE BACKGROUND

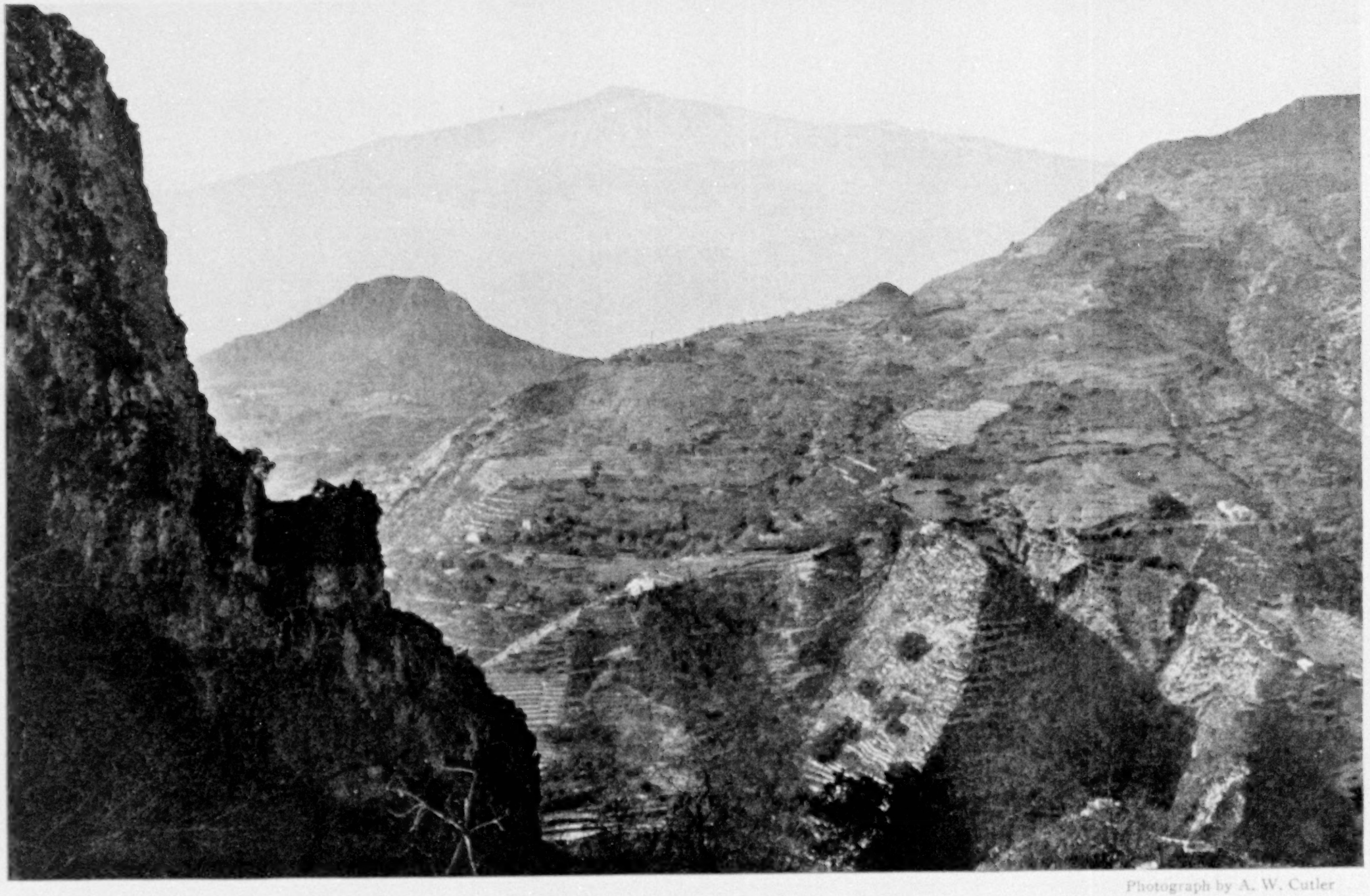
The portion of Sicily in the immediate vicinity of Taormina was known to Ulysses as the Land of Cyclops, for beneath Mount Etna these giants labored in the workshops of Vulcan. In the foreground of the photograph are shown the ruins of the Greek theater, built more than twenty-three centuries ago, upon the side of Monte Tauro overlooking the Ionian Sea. It is 357 feet in diameter and incloses an orchestra 115 feet in width (see also text, page 313).

XUM

© F. Galifi Crupi

ISOLA BELLA AND CAPE SAN ANDREA, BELOW THE CITY OF TAORMINA

Taormina crowns the most majestic height on the Sicilian coast. The early Greeks built upon the spot their ancient Tauromenium. In the immediate vicinity nine different varieties of marble are quarried.



Photograph by A. W. Cutler

ETNA AND ITS ENCIRCLING HILLS SEEN FROM MOLA

The view from Mola, with its impressive panorama of mountains terraced for cultivation, is one of the most glorious in the whole of picturesque Sicily. Etna, the highest point on the island, rises gently in the background to an elevation of 10,758 feet (see text, page 321).

In the church where this effigy is deposited pots of green, sprouting grain are ranged about the coffin. Some students see in this a form of pure Ceres worship, inherited from the Greeks. Moreover, it recalls Egypt's little grain-containing clay mummies, out of which, when they were placed in water, wheat spears would spring from the effigies of the dead Osiris.

Meanwhile, outside the church, defiles a multitude of black-clad, candle-lit mourners, young and old, each bearing some symbol of the Crucifixion—the nails, the hammer, the spear, the scourge, the sponge, the scroll, the napkin—and a characteristically naïve touch is attained by the wearer of the crown of thorns when he politely doffs it right and left to the spectators.

At Easter noontide the sound of bombs bursting around the cathedral, where mass was being celebrated, was followed by the crash of old crockery, hurled from the rooftops, and the descent of armfuls of chicken feathers. (Pot-smashing, to bring good luck, is practiced in Asia Minor, as is the equally cryptic custom of releasing doves in springtime.) Then small boys hammered lustily on the cathedral doors, which were thereupon thrown wide open, while from behind the altar rose a little waxen bambino (the risen Christ) with an Italian flag in his hand.

It is such primitive folk-drama that combines the religion and the art of this people. As a contrast, the similarly rude myth representations of their forerunners, the early Greeks, flowered forth as classic tragedy in the theaters of Taormina and Syracuse.

APPROACHING MOUNT ETNA

February's almond-blossom season, Sicily's lovely substitute for snow, had become a blizzard of smothered trees and drifted hillsides when we pushed Etna-ward from Taormina. For weeks past, the volcano, crowned with smoke clouds shaped like the umbrella pine, and spurting jets of molten-red lava, had warned us daily that we must visit it soon or not at all.

We were just in time.

Starting at Giarre and ending at Catania, in part by rail and in part by motor car, we made a 68-mile circle around the volcano, under the shadow of its 10,758-foot summit.

First came a steady lift from seaboard, through Piedimonte and Linguaglossa, with lovely hillside prospects of lemon-orchards leading to yet higher levels carpeted with wild flowers and shaded by oak glades.

It was refreshing to glimpse big trees. Sicily, after centuries of ruthless deforestation, is to-day but 3 per cent timbered. As to her wild flowers, one botanist tabulates 138 species peculiar to the island. The classic asphodel, which spatters her fields like a Milky Way, is as common as the daisy is in the United States.

For some hours, only the black lava blocks, of which the roadbed, fruit terraces, and irrigation ditches were built, hinted of our proximity to a volcano. Then, approaching Randazzo, one saw the brown soil of vineyards. This cultivated space, only nine miles from the crater, had been literally hewn out of the surrounding lava bed.

HOW NATURE PROFITS BY THE RAVAGES OF FIRE

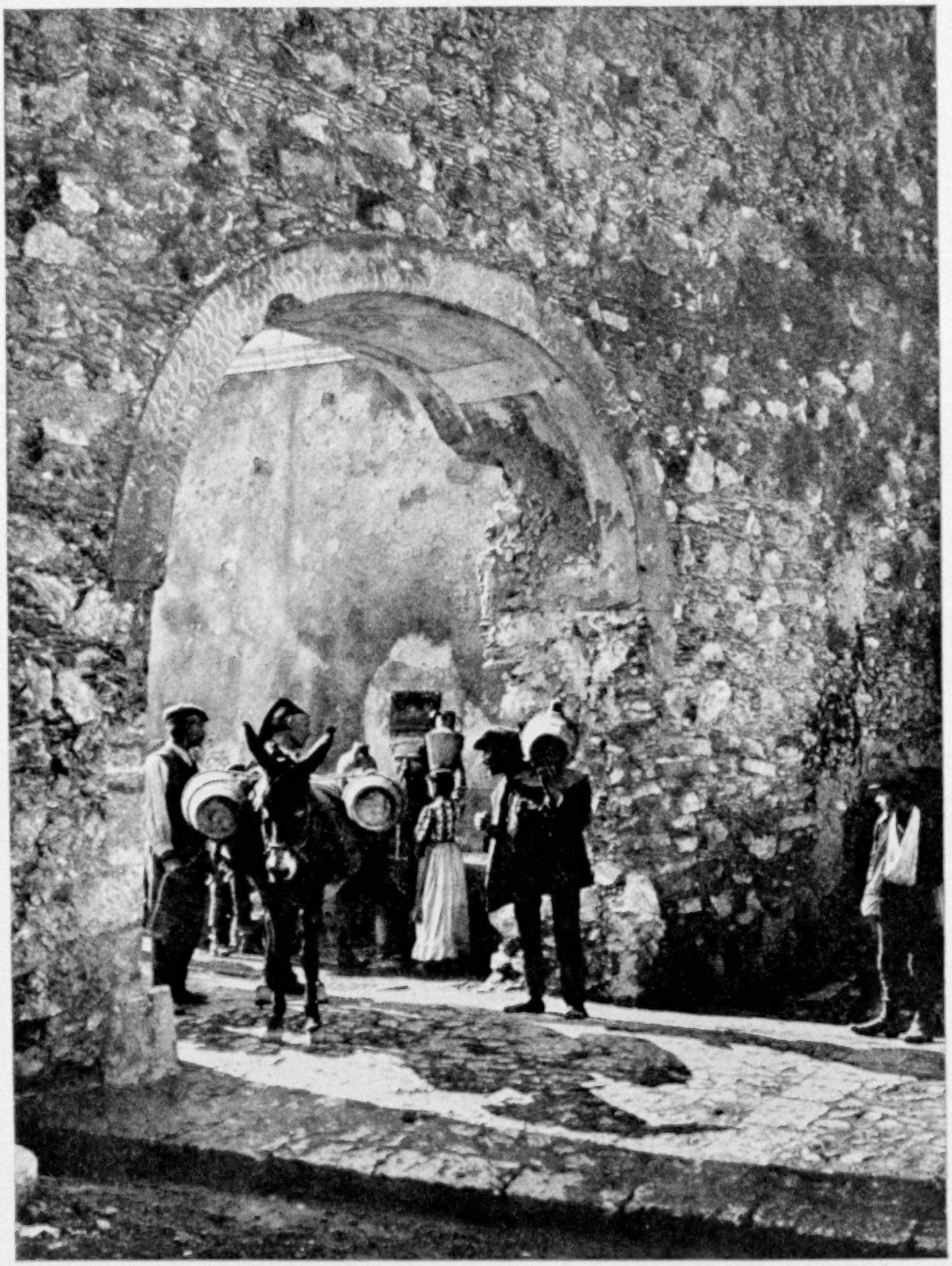
Randazzo, so close to the great cone that you need a gas mask when the wind blows the right way, shelters its entire population of 12,000 in houses built of lava. The surrounding hamlets, whose inhabitants have left unpainted the lava of 1911, after using it in construction, present, in their coal-black cabins, retaining walls, and blasted-out gardens, a scene of unforgettable melancholy and heroic accomplishment.

Something like 100 eruptions, of which 19 occurred in the past century, have been recorded to the credit, or discredit, of Mount Etna; yet considerably more than half a million people continue to live on its slopes, which through titanic toil they have transformed into a veritable fruit orchard.

As our road threaded onward under the great, white cone, zebra-striped where the rock peered through melting snow, we beheld the successive stages whereby ancient lava fields have become the productive soil of to-day.

First, you skirt a tract of Etna's more recent vomitings—a black, horrific lava sea, looking as if the earth had boiled and hardened into wavelike monstrosities.

XUM



Photograph by A. W. Cutler

A SUNLIT FOUNTAIN AT TAORMINA

The small casks slung across the donkey's back are used throughout the country for carrying wine and water. The pages of Taormina's history abound in deeds of daring and of sacrifice, such as that of her forty immortals who had themselves hoisted by ropes to the summit of the rocks of Mola, and from this vantage point succeeded in surprising and overpowering a French garrison in 1677.

Not a tree, not a flower, not a bird. It is Nature's Black Death.

Next, passing a somewhat older lava tract, you find it to be embrowned with powdery dust, with here and there some ghoulish cactus rearing its head.

A few miles farther on, a yet older tract reveals a miracle. The deepened dust layer is covered with a veil of verdure, amid which the upstanding hideosities of the flow are completely clothed with cactus growth.

And last, in the tract of greatest age, you behold smiling orchards of almonds and mulberries, and vineyards surrounded by lush meadows, where peasants are picking the wild asparagus. Only the bizarre sight of some roadside Madonna, in her shrine of black lava, remains to suggest that what to-day is pastoral peace was long ago a torrent of liquid fire.

IN THE PATH OF DESTRUCTION

A few weeks after we had circled Etna the villages where children had yelled at our passing motor car had disappeared under a lava sea 30 feet deep and a mile wide. Linguaglossa's people, having arrested the lava flow—so they claimed—by planting in its path the miracle-working crozier of Saint Egidius, were knifing Castiglione's townsfolk, whom they suspected of stealing the staff for their own safety. And to-day tens of thousands of refugees have crept back to Giarre, Catena, and other lava-drowned villages to renew the Etna-dweller's age-old struggle with Nature.

It is Catania which, always rising afresh from repeated destruction, typifies man's triumph in that struggle. Only 17 miles distant from Etna's central cone, this city of 200,000 people, with its lava pavements, lava business blocks, lava fountains and statue pedestals, is one of Sicily's chief gates of export, through which some 600,000 tons of merchandise pass annually.

Thanks to sulphur, fruit, and wine, the Catanians have amassed fortunes under the volcano's very shadow, and may well boast of their town as being "Etna's child." The city's patron is Saint Agatha, who, in defense of her virtue, suffered death in the third century at the hands of a Roman prætor. It is said that in 1669 her veil miraculously diverted a 14-foot lava stream which menaced Catania. This veil has become the city's palladium, and every February the saint's relics are borne reverently through the thronged streets.

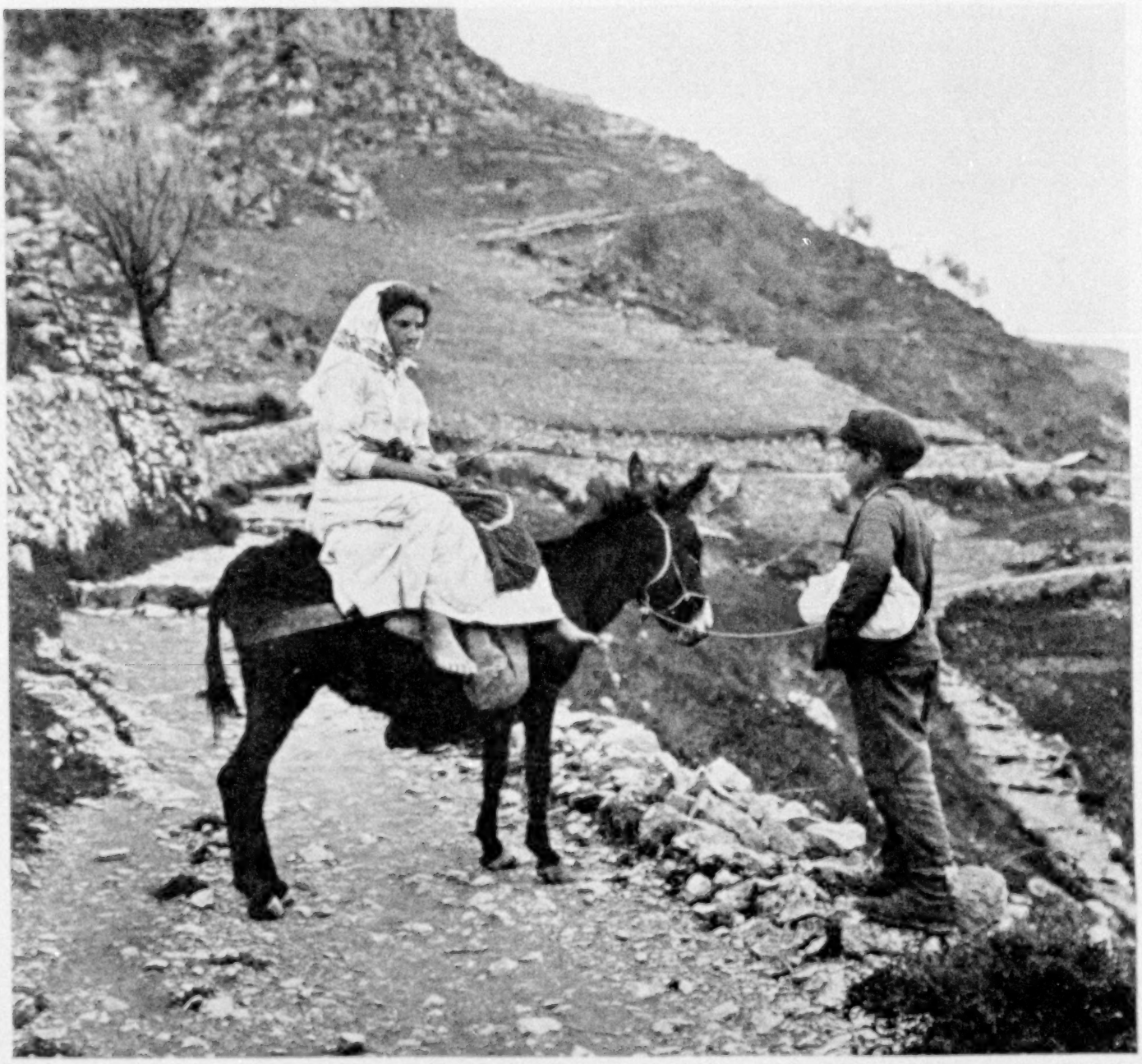
A LIVELY SCENE IN CATANIA ON SUNDAY

Catania is seen at its liveliest on a Sunday morning after mass. The cafés are crowded with people enjoying the Sicilian's matutinal snack of bread dipped in lemon ice. Fantastically attired youths pass among the crowd, urging subscriptions for the six-foot votive candles which they carry on their shoulders. A thousand vivid-faced school children file past, chanting the Fascist anthem of "*Giovanezza! Giovanezza!*" and a bystander explains that, thanks to special Fascisti propaganda, every child knows the national significance of that call to the "Youth! Youth!" of all Italy.

At the cathedral door, beggars, each with a flapping coat sleeve (the missing arm being tied behind the back), are receiving alms aplenty from the piously minded. The bazaarlike market swarms with pushcarts. These are oaken, hand-carved family heirlooms, whose center poles, of a cruciform construction, stand erect among the potatoes or onions when one's cart is at rest, thus lending a religious aspect to the scene of barter.

Roundabout walls and street doors are covered with crape-framed death announcements, dedicated to every degree of relationship: "To my adored aunt," "To my beloved great-uncle," "To our deplored director, tragically ended." On one wall hangs a wayside shrine—candles, altar cloth, and flowers complete—to commemorate Signora C.'s loss. Directly opposite this shrine a gambling proprietor is running a table for the convenience of the outcoming churchgoers. You put your coppers on one of thirty squares. He tosses thirty paper scrolls up and down in a hat, skillfully allowing one—the winning number—to fall upon the board. Old stagers stand around, noting the winning numbers in their system books.

Down a side street is discerned a gaunt individual, his head and shoulders just visible above the listening crowd. His supplicating face is lifted to heaven; he beats his breast. An itinerant preacher,



Photograph by A. W. Cutler

PEASANTS ON THE MOUNTAIN PATH LEADING FROM TAORMINA TO MOLA

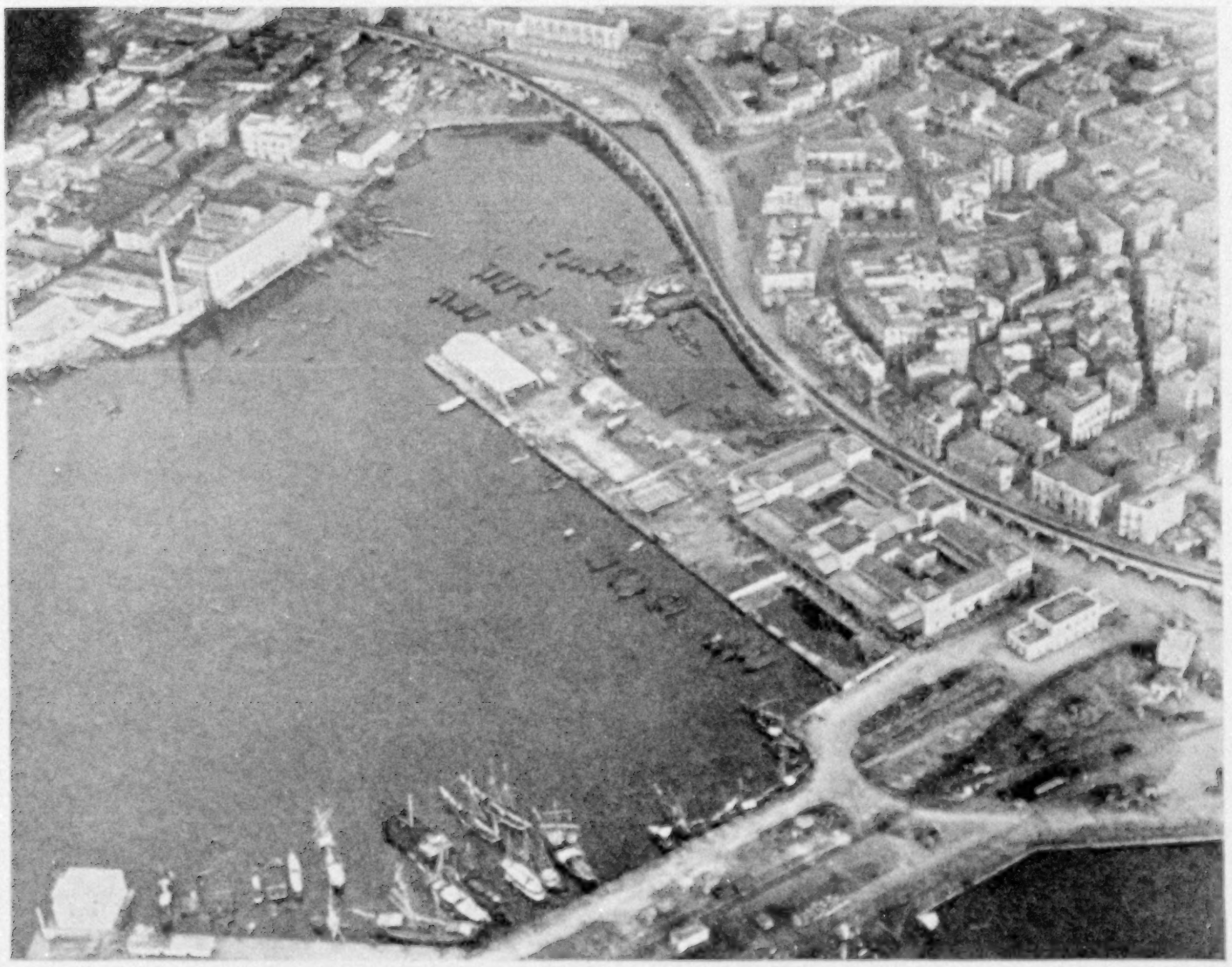
The only approach to the Saracen village of Mola is a winding pathway up the hillside from Porta Messina, by which the army of Dionysius, during the winter of 374 B. C., climbed to surprise the garrison. One must enter this curious old medieval city through a picturesque gateway which bears the date of 1578.

one thinks. But, seen at closer quarters, as with fervid gesture and torrential eloquence he creates an entire drama of asseveration and appeal, he more nearly resembles a political orator rousing his countrymen to great issues. Then the crowd parts and you perceive that he is merely a street hawker crying up a bolt of cloth, according to the Sicilian school of salesmanship.

Our southward-bound train freed itself from Etna's flanks, crossed the wide plain which constitutes one of Sicily's richest granaries, then swung coastward to Augusta, giving us a last, spectral glimpse of the volcano, seen across 40 miles of curving sea front.

SICILY'S GREAT SALT WORKS

Augusta and Trapani share Sicily's sea-salt industry. At those towns the shore line reveals a succession of cement reservoirs, the entering tidewater being pumped from tank to tank, while the fierce Sicilian sun does its work of evaporation. The residuum, averaging 93 per cent pure salt, is refined in the abutting windmills. Sun, wind, and tide are practically the only workers required in this all-the-year-round industry. In 1922



Photograph from Air Ministry, Great Britain

AN AIRPLANE VIEW OF THE HARBOR OF CATANIA

Second in importance to Palermo among Sicilian ports, Catania exports sulphur, oranges, wine, grain, linseed, and almonds, and its citizens are noted for their perseverance and prosperity despite the affliction of numerous earthquakes (see text, page 323).

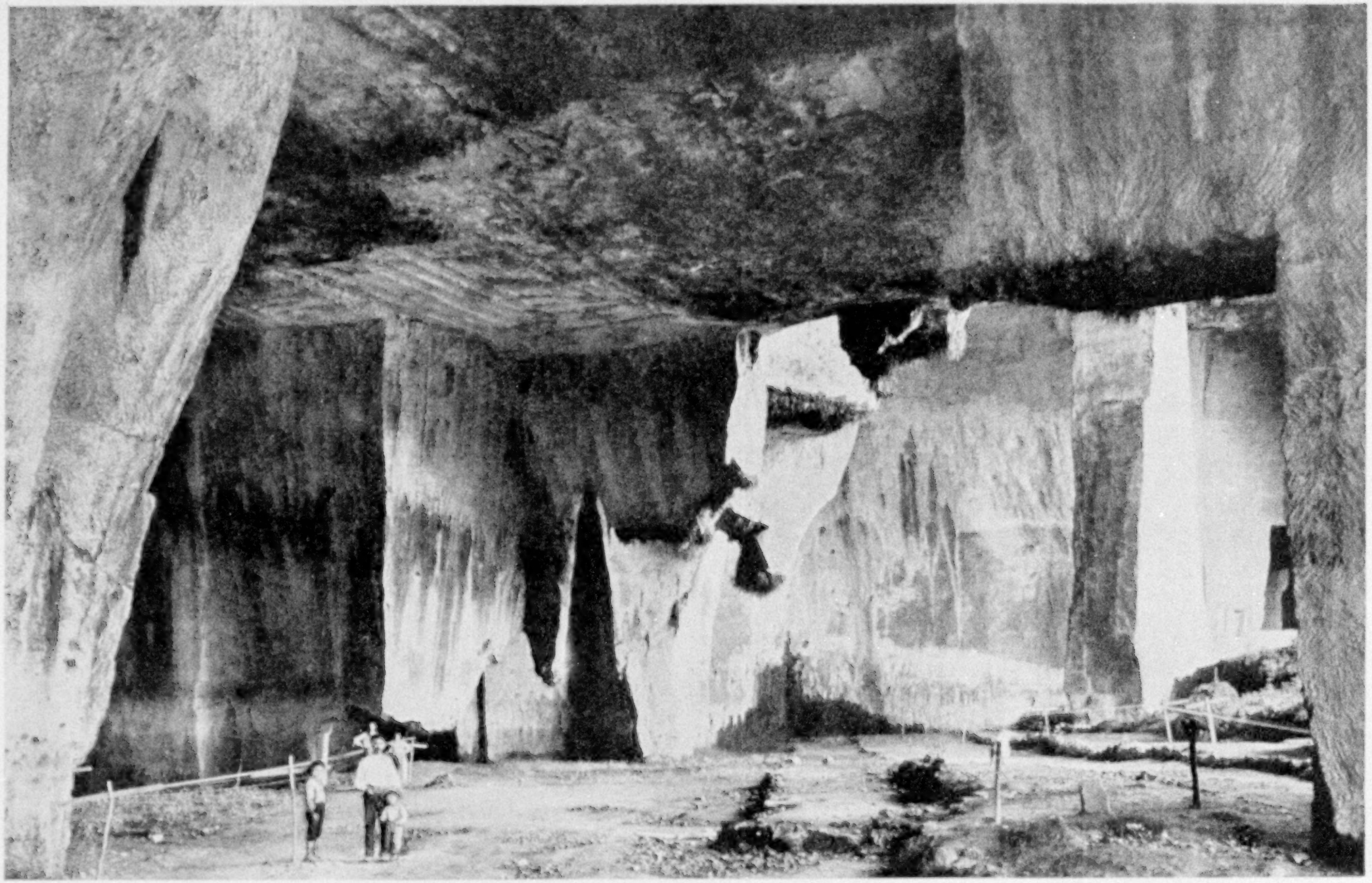
Trapani produced 300,000 tons of evaporated salt, the Scandinavian fish-curing industries buying most of it.

From Augusta an inland detour by motor bus leads to the cave-town of Pantalica, where, resembling some vast amphitheater, thousands of tomb chambers, hewn by the ancient Sikelians, honeycomb the cliffs of the Anapo River valley.

SYRACUSE, WHERE GREEK GENIUS FOUND A SECOND HOME

Following this stream's course coastward, the traveler cuts across to another small river, the Ciani, where boatmen pole him down to Syracuse through luxuriant growths of papyrus. Here this plant has flourished ever since the Saracenic occupation, its importation from Egypt being indicative of Sicily's close relationship with Africa at that period. The vast expanse covered by the scattered remains of classic Syracuse corroborates ancient reports that this second Greek settlement in Sicily was 22 miles in circumference and contained half a million people. Its two existing quarries—stupendous labyrinths, wherein, at 130 feet below street level, one easily loses one's self—testify to the creation of magnificent public works, in the construction of which some 7,000 Athenian prisoners of war once slaved and died as quarrymen (see page 326).

These works included Doric temples, gymnasia, a city wall, two vast aqueducts, one of the largest Greek theaters extant, and harbor fortifications which guarded the most powerful fleet in the Mediterranean. It was the tyrant Dionysius, the creator of this fleet, who scrapped the



Photograph from Melville Chater

ONE OF THE FAMOUS QUARRIES OF SYRACUSE

From these quarries came the building material for the ancient city of Syracuse, whose population has been estimated at from half a million to a million and a half. They were also used as burial places and sometimes as prisons. The Latomia del Paradiso came to be known as the Ear of Dionysius, because that monarch is reputed to have placed political prisoners of distinction in the quarry and listened from the platform above to their conversations (see text, page 325).

traditional trireme, a galley of three oar-banks, and initiated dreadnaughts and superdreadnaughts of four and five oar-banks, respectively.

Greek genius found a second home at Syracuse and, indeed, throughout Sicily. To the island came Pindar, Sappho, Empedocles, and Pythagoras. Plato visited it three times. Æschylus wrote of it, in "The Women of Etna" and followed his drama, "The Persæ," thither, when, as modern managers would say, it "went on the road." The sixty-tiered theater, chiseled from the rocky hill commanding Syracuse, has echoed to the verbal pomp of his lines—echoes which were reawakened twenty-five centuries later, when in 1922 moderns sat in the old Greeks' seats, witnessing performances of "Œdipus" and "The Bacchantes."

The glory of Syracuse has departed. The pure columns of Minerva's shrine are imbedded in the structure of a baroque church. Apollo has become the victim of feminism, his ruined temple being locally misnamed as that of Diana. And we overheard a yet stranger misinterpretation applied to the papyrus-bordered Fountain of Arethusa. Diana, who transformed that nymph into a fountain in order to save her from the river god Alpheus, never dreamed of the weird metamorphosis she would undergo in 1923.

It was in a Syracusan restaurant that we happened to sit next to a tourist couple who, I suppose, were suffering from the mental indigestion which is caused by a too rapid perusal of guidebooks. Wine had been mentioned between them. Said the husband, turning to the waiter:

"Bring us a bottle of Arethusa." His wife nudged him.

"'Tisn't a wine, dearie," she whispered; "it's a mineral water."

THE GLORIES OF ENNA ARE GONE

Even more utterly have disappeared the glories of ancient Enna, which, under its modern name of Castrogiovanni, skirted the next lap of our zigzag. It was the scene of Persephone's kidnapping by Pluto, this massive, horseshoe-shaped peak which of old bore temples to Mother Demeter and her stolen daughter. Once so rich in wild flowers (say the Greek poets) that hunting dogs lost scent of the game, to-day Enna is but a barren height in the mine-dotted sulphur region Pluto, lord of the underworld, has ousted the grain goddess Demeter. Nevermore will the coming of Persephone carpet Enna with spring flowers.

"THE MOST BEAUTIFUL CITY OF MORTALS"

From Castrogiovanni we followed the sulphur trail southward. Caltanissetta, the center of the industry, showed crowds of idle miners wandering about the streets, with a chaperoning army unit in case of trouble. Due to an after-war subsidence of the sulphur boom, eight mines were reduced to half-time, then to quarter-time, and to-day the government pays a small dole to the workmen thus affected.

"If you want to see a sulphur mine in operation," an official advised us, "go to Girgenti."

So we went southward again through ever more dreary country, where distant brown splashes on a hillside meant that men were burrowing for the "zolfo," and where the land was pimpled with tiny gas-emitting cones—Nature with a skin disease.

Then suddenly we entered a vast green plain slanting upward to a crag-set town, Girgenti, and outward to the smiling sea; and amid the plain's flexures rose the chaste columns of golden-brown temples, seaward-facing, in their Doric dream.

We forgot all about sulphur. Here was the unique monument of the Greeks in Sicily.

At Athens the Parthenon abuts on a modern city, and you are just one of a distracting throng of visitors. At Girgenti the eternities surround one—the sleeping plain, the dreaming sea, the timeless skies—as amid age-old silence he stands, pigmylike, before the temples of Concord and of Juno Lacinia, golden brown against blue spaciousness. So perfectly preserved is the Concord that could the old Greek architect come back he would marvel at his 2,300-year-old masterpiece (see page 331).

Of the other five temples, or temple ruins, that of Zeus is the vastest of Greek antiquity. Five laps around its foundations, as a runner might say, would make a mile, while its former height is suggested by a prone Titan, designed to uphold a cornice and measuring 25 feet. By

© Elmendorf

SICILY'S RISING GENERATION

During the middle of the last century more than 90 per cent of the Sicilians could neither read nor write, and, though rapid strides have been made in education since that time, the percentage of illiteracy is much higher than on the Italian mainland. Sicilian children, however, are naturally quick and responsive.

Photograph by F. Galifi Crupi

"FRESH MEAT TO SELL!"

An itinerant butcher of Sicily peddling his wares through the streets of Taormina. His staff indicates that he sells goat meat.

Photograph by A. W. Cutler

THE HURDY-GURDY OF SICILY

The *ceramella*, made of pigskin, emits a noise akin to that of the Scottish bagpipe, but the Sicilian instrument is more lusty (see also page 312).

Photograph by Melville Chater

THE MODERN TOWN OF GIRGENTI FROM THE ANCIENT PLAIN OF AKRAGAS

Girgenti was called by Pindar "'the most beautiful city of mortals." To the south of the city site the Greeks built their Temple of Juno Lacinia, Temple of Concord (see opposite page), Temple of Hercules, Temple of Zeus, and Temple of Castor and Pollux.

one of Time's ironies, the temple of mighty Hercules is only recognizable by a sole column, propped in place by modern supports. The exquisite corner of the Castor and Pollux temple haunts the imagination with its mutilated beauty, as does the Winged Victory.

These, the remains of what Pindar once called "the most beautiful city of mortals," standing solitary in the wind-swept plain of Akragas, enshrines the Greek genius, just as desert-surrounded Thebes and Karnak enshrine that of Egypt.

Picking up the sulphur trail afresh, we drove across country to Cevalotto. Here was a stark, chimney-topped hill rising sheer from the plain, across which filed peasants bearing bags of fine sulphur with which to sprinkle their vineyards as a protection against the phylloxera pest.

DOWN IN A SULPHUR MINE

Atop of the hill we were met by a group of miners, who by the light of their little oil lamps guided us down a narrow, precipitous tunnel which descended into the bowels of the earth.

At each successive level gangs were chipping away with long pikes at the surrounding walls of quartz, which gleamed like topaz under the passing lamps. It

THE TEMPLE OF CONCORD AT GIRGENTI

The ruins of the Greek temples at Girgenti are, perhaps, the most majestic of the ancient Hellenic world, and the Temple of Concord is the best preserved specimen in Sicily. It stands practically in its entirety except for the roof, possibly due to the fact that it was used as a Christian church during the medieval period. It is built of yellow sandstone and has been said to be the most harmonious example of Doric architecture in existence (see page 327).

was lunch hour, yet they worked steadily on, merely swallowing a bit of bread and cheese or a mouthful of wine, from time to time. The atmosphere weighed oppressively, and of course one was inhaling sulphur dust at every breath.

SICILY UNTIL RECENTLY PRODUCED 95 PER CENT OF WORLD'S SULPHUR

We toiled upward and, out into the blinding sunlight, speculating as to what was, in the case of sulphur miners, to use an insurance phrase, "the expectation of life." To our surprise, we met dozens of middle-aged workers who had been mining sulphur ever since they were ten years old. Certainly two things had combined in their favor: First, that the Sicilian sulphur worker lives in open country and not in congested cities, and, next, that his eight-hour day is over at two in the afternoon. The pay is miserable—from 6 to 12 lire per diem—as contrasted with 25 to 50 lire paid to sulphur handlers at the seaports.

That the Cevalotto miners must daily descend and ascend the shaft for great distances on foot indicates the primitive methods existing in the Sicilian sulphur industry—methods which, officials say, cause a one-third loss in production. Yet, until very recent times, Sicily mined 95 per cent of the world's output.

The bluish-gray ore, thrown into kilns built in the hillside, is set alight and allowed for twenty-four hours to smelt itself with its own heat. For four more days the liquid sulphur drains off into molds which turn out 100-pound blocks of the crude product. This five-day process yields per kiln from two to two and a half tons of block sulphur, for shipment to Catania, Porto Empedocle, or Termini, where the refining plants are situated. Meanwhile the kiln smoke, piped away to lofty chimneys, yields, upon condensation, a highly refined product resembling yellow snowflakes and known in the chemical trade as flowers of sulphur.

Etna, by the way, is not the only dan-

Photograph by Melville Chater

STACKED SULPHUR, "THE GOLD OF SICILY," AT PORTO EMPEDOCLE

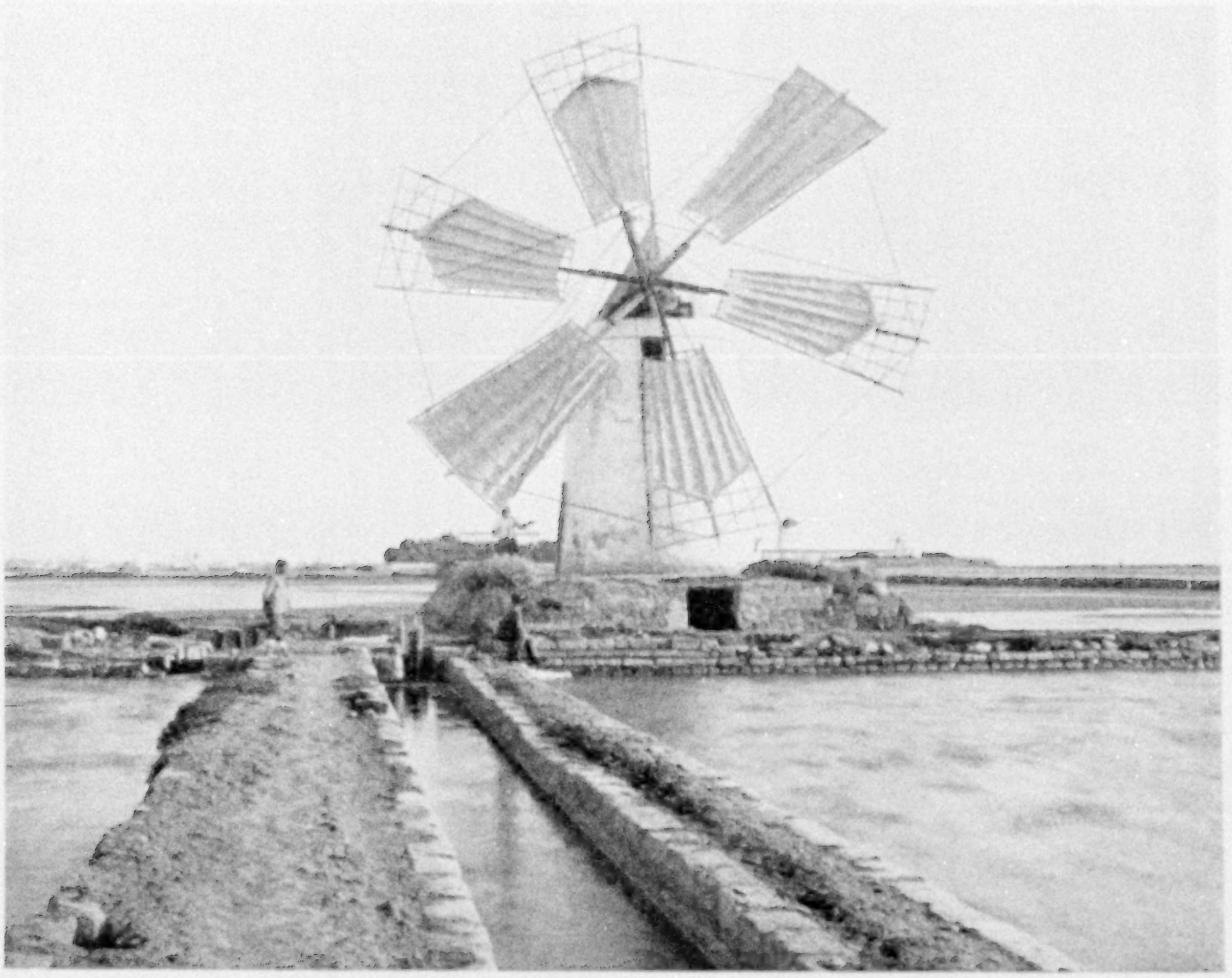
There are some 500 sulphur mines in Sicily. When running at full time their output is 400,000 tons annually and they offer employment to 30,000 men, but the development of the sulphur beds of Louisiana has done much to hurt the Sicilian industry.

ger point in Sicily. Porto Empedocle, the mine region's seaport, had a horrible fright when, in 1920, revolutionists fired 300,000 tons of block sulphur. Engine companies were rushed from all over the island, hundreds of people were asphyxiated, and 80,000 tons of burning sulphur were thrown into the sea.

Sicilian sulphur production reached its peak in 1909, with 600,000 tons. But American ingenuity has outstripped the old methods by a hot-water process which melts the sulphur out of the ore at the bottom of the mine. Thus American production had reached 1,344,000 long tons in 1922, while to-day that of Sicily has declined to 200,000 tons, the industry being supported by government subsidy.

We had planned a sixty-mile trip from Girgenti across the island on donkeyback; but the two *carabinieri*, into whose care we had been committed while in the mining region, would not play the game. Military dignity astride a donkey was unthinkable. So a carriage was ordered and, rifle between knees, they took their positions beside us.

Lovely country and small, squalid towns with crowded jails lay along our route into the interior. Occasionally a passing donkey, bearing a peasant mother with one baby seated before her, another



Photograph by Alinari

MARINE-SALT EVAPORATING RESERVOIRS

Augusta and Trapani, the two salt towns of Sicily, export to Norway and Sweden large quantities of salt evaporated from sea water. The windmill furnishes the power for refining the salt taken from the cement reservoirs into which the tidewater flows (see text, page 324).

behind her, and two more in the side panniers, served to remind us that the Sicilians are, whatever else, a prolific people.

At noontide our carabinieri regaled themselves on dry bread and a wayside loot of broad beans, hulled and eaten raw. We two lunched among some spaghetti-inhaling peasants at a wayside hostel. There I stretched myself on a sofa for five minutes, and this accommodation promptly appeared on the bill as "Repose, two lire," an item which was as promptly crossed out at a scowl from our watchful carabinieri.

THE PICTURESQUE BRIGAND HAS VANISHED

From this we concluded that Sicilian brigandage had been brought to a pretty low ebb.

That the picturesque brigand no longer infests the interior; that his womenfolk no longer boast of having "planned a little burglary, and forged a little check, and slain a little baby for the coral on its neck," is due to the unremitting vigilance of the carabinieri. We soon discovered that this fine body of men, who continually scour the country, turning up unexpectedly at out-of-the-way places and reporting from town to town at their commandants' headquarters, are regarded throughout Sicily's hinterland with soul-satisfying dread.

Our first night on the road was typical. Scene, a small town in the sulphur country, *en route* for the mountains which ring the Palermitan plain. Time, dusk, through which we discern the faces of a distinctly tough-looking crowd that presses, gesticulating and explaining, about our carriage.

No accommodation for travelers; no relaying carriages obtainable; but the

Photograph by A. W. Cutler

THE "PONY EXPRESS" THROUGH THE SICILIAN MOUNTAINS NEAR CALATAFIMI

Mail-carrying under an armed guard through the wild hills in the vicinity of this mountain village has many of the hazardous features of the early stage-coach journeys through the American West. Garibaldi, the great liberator of Italy, won his first victory over the Bourbon troops on May 15, 1860, just outside of Calatafimi.

spokesman, an unprepossessing individual, offers us a cart holding just two passengers, and *without room for our carabinieri*, which will land us in the next town by 10 o'clock that night.

As we are hesitating over this rather dubious offer, our carabinieri return from headquarters, accompanied by the local commandant. At sight of him the crowd melts miraculously, the whole town seeming to take on that profound peace which springs from brotherly love.

"No accommodations? Liars!" Thus the commandant, who knocks smartly at a near-by door. It is opened by an obsequiously bowing man who conducts us to a dingy bedroom.

We now explain to the commandant that there are no carriages to be had. "Liars!" he growls out again, and dispatches one of his men. Within a few minutes three obsequiously bowing jehus turn up, each soliciting the honor of offering his plush-lined equipage to the superlatively gentle American travelers *and their carabinieri guard*, on the morrow.

EAGER HOSPITALITY SUCCEEDS HOSTILITY

There is a general scurry as the hostel's every inhabitant rushes zealously about at bread-cutting, wine-pouring, bed-making, and what not, while the commandant watches them with the keen eye which a dog-trainer levels at half-broken retrievers. His last act is to incarcerate each and every tenant in his proper chamber, upon which he turns the key from without. Then, warning us to lock our windows overlooking the street, he departs.

One old woman, who has managed to elude imprisonment, creeps apologetically in to show us photographs of her grandchildren in Chicago, and to beg us to assure *il capitano* that she and her household are honest folk.

Next morning the commandant reappears, effects a jail-delivery of our fellow-tenants, cuts the landlord's presented bill in half, and warns him not to over-

Photograph by A. W. Cutler

A GOOD-FRIDAY STREET PROCESSION IN PALERMO

charge travelers in future. Then he informs us that the man who offered us a night ride in a cart sans carabinieri is now behind bars.

"They are all rascals and they all stand in together," the commandant warns us, as we climb into our carriage. "Never allow yourselves to be separated from your guard." And we depart, leaving that tough Sicilian town wrapped in a holy calm.

THE MACHINATIONS OF THE MAFIA

A hatred of all government institutions, including, of course, the carabinieri, lies at the root of the far-famed *Mafia*. A century of the tyrannical Bourbon rule taught the Sicilians that they could only hope for justice through secret organization among themselves. Evil brings forth evil; tyranny produced the Mafia; and sixty-odd years of liberty have not sufficed to teach the Sicilian masses that the State is other than an oppressor—at best an impertinent interference—to be frustrated wherever possible.

The Mafia has no headquarters, elects no officers, and indulges in no annual clambake. It is less an organization than an ingrained spirit in men's breasts, which can act with little prearrangement. Originally well-intentioned, a kind of *vigilante* movement, it has sunk into the very unscrupulousness it was formed to combat.

For a consideration, it avenges private quarrels, assists smugglers, and induces proprietors to advance wages. Yet any employer may enjoy a species of insurance by merely hiring *mafiosi* as workmen. But though the Mafia resorts to sheep-killing, crop-burning, and blackmail, it preserves its little decencies. Thus, in one case, where a popular priest had been dismissed for some irregularity, a leading mafioso was asked just how the successor was to be done away with.

"We do not harm priests, *signore*," was the reply. "No; we are going to kill the newcomer's brother."

One temperamental difference between the Mafia-bred Sicilians and their Italian

By Publishers' Photo Service

A WAYSIDE SHRINE ON MONTE PELLEGRINO

On this mountain, which overlooks Palermo, Hamilcar, the Carthaginian, settled with his soldiers and their families in 247 B. C., in order to keep the Roman garrison of the city at its feet in check. A zigzag bridle path leads to the summit of Pellegrino, where, under an overhanging rock, is the Grotto of Saint Rosalia, patron saint of the Sicilian capital (see text, page 346).

cousins is arrestingly disclosed in the fact that for every murder committed on the mainland ten are committed on the island.

PRIMITIVE AGRICULTURAL METHODS

Our way across the interior revealed great treeless belts of wheat and broad beans, lying between towns ten miles apart. But to-day the "granary of Italy," as Sicily was once called, hardly suffices to feed its own four million people. It is largely due to the evils of the *latifondi* system, whereby some 787 absent landlords own one-third of an island whose area is 95 per cent agricultural, and the farm tenants work under incredibly backward conditions.

Instead of modern machinery, the Sicilian agriculturist uses primitive plows and garden tools. Instead of employing fertilizer, he rejuvenates his field by letting it lie fallow as a cattle pasture. Yet, for lack of an equable rainfall, five acres of such pasturage per animal are scarcely sufficient.

The farmhouse consists of a big, wigwam-shaped cabin of straw, where the members of the family live for most of the year, subsisting on bread, cheese, wine, and beans. Since they can neither

Photograph by A. W. Cutler

ONE OF THE LONG CORRIDORS IN THE CATACOMBS AT PALERMO

In the open coffins, covered over with glass or wire netting or strung in an upright position on the shelves, there are more than 13,000 human skeletons, each bearing a label of identification. This custom, which formerly was prevalent throughout Sicily, is now prohibited by the Italian Government.

Photograph by Melville Chater

BEHIND THE SCENES IN A MARIONETTE THEATER AT PALERMO

The moving pictures have never been able to wean the Palermitans away from their beloved marionettes. Some of the dramas, whose words and business have been handed down by word of mouth for centuries, extend serially for a period of six months and others for an entire year (see text, page 352).

read nor write, their sole recreation consists in story-telling, which they so enrich with gestures that, beyond earshot, it resembles a sign-language recital.

ILLITERACY IS THE CURSE OF THE ISLAND

Illiteracy is the curse of Sicily. At its incorporation with Italy in 1860, not one person in ten could read or write; and though 1904 brought to all large communities a compulsory-education law, such governmental coercion does not suit the Sicilians. In 1911 illiteracy still claimed 58 per cent of the population.

To-day one commonly sees parents depending on their young children for letter-writing; and should you hire a native servant you must not be surprised if she calculates her marketing accounts by laying out beans on the kitchen floor.

THE FEAST OF SAINT GEORGE AT MOLA

In the interior towns, often consisting of but a few hundred shut-in souls, religion is the very breath of life. Each saint has his or her particular function in the welfare field: Saint Lazarus for burns, Saint Lucia for trachoma, Saint Rosalia for accidents; and every town—yes, every hamlet of a few hundred souls — has its beloved patron in the Catholic martyrology. Touching, often most beautiful, are the ceremonies of these little communities on the annual festa of their protector.

Picture, for example, a tiny, nestlike village of 500 souls, perched on the apex of a 1,500-foot peak, with green valleys dropping declivitously from its very doorways, and far below a vast seascape. Such is Mola, whose 20 tortuous streets hump and hollow like the course of a scenic railway, and whose 100 humble dwellings, were they not ringed about by the walls of this sometime Saracenic fortress, might easily be caught up by the fierce *tramontana* (mountain wind) and hurled into the sea (see page 320).

But even Mola has its patron saint, Giorgio, and its festal pageant, as the

Photograph by A. W. Cutler

HELPING MOTHER: A SICILIAN VILLAGE SCENE

light of any springtide's first full moon will show.

Far from being England's exclusive property, Saint George and his dragon are found acclimated in various European and Near Eastern countries. He is a favorite saint in Russia and in Georgia. Some scholars trace him and his legend back via a certain Georgius who was martyred under Diocletian, to Perseus and his slaying of the dragon.

At Mola his festa was postponed until almost a week beyond the correct date for the sake of a full moon. All afternoon donkey-bestriding pilgrims from the surrounding countryside had been ascending the mountainous footpaths to the little public square. The population had jumped to several thousand and the crooked streets were hung with palm fronds in honor of the great event.

At sunset an enormous tissue receptacle was inflated with hot air, gradually taking shape as a floppy giant—Saint George astride of his white horse. Up he went, lance in hand, his steed majestically afloat on the light wind; and meanwhile the peasant pilgrims cheered and applauded, shouting, *"Viva San Giorgio! Viva il buon' padrone di Mola!"*

Such was the prefacing comedy. Then through the gathering dusk a silvery light dawned along the sea horizon and up swam the moon, laying the multitude under rapt silence. That was the hushing interlude.

What are those somber drum taps issuing from the little church? Who are these strangely appareled, candle-bearing figures, filing solemnly forth like a funeral procession, in step with the drum dirge? And that which follows in their wake, is it a coffin surmounted by the ghost of a mail-clad knight on his white wraith of a horse?

The peasant pilgrims swarm from the square, pressing shoulder to shoulder in the maze of uphill streets, there to kneel bareheaded, as slowly their patron saint, his float upborne by pallbearers, passes by.

White-robed men, the local townsfolk, with blue-caped shoulders, their brows bound with the flowing Arab *caftan*, head the procession. Then follow white-robed women, and next six white-robed

Photograph courtesy of Royal Italian Embassy

THE CAPITAL OF SICILY PHOTOGRAPHED FROM THE DIRIGIBLE "ROMA"

Palermo, which has a population of 400,000, enjoys the sobriquet of "La Felice" because of its delightful climate and magnificent location, between the mountains and the sea, on the northern shore of the island. From its wharves boats aggregating more than a million and a half in tonnage annually clear for foreign ports. The Greeks called the port *Panormus*—All Harbor.

By Publishers' Photo Service

THE NEW MILITARY ROAD BEING BUILT TO THE TOP OF MONTE PELLEGRINO

Along the edge of the bay between the two horns formed by the mountains of Solous and Pellegrino, the greatest of all the Phœnician settlements in Sicily was founded. So fruitful was the plain about the water's edge that it came to be known as the Golden Shell (Conca d'Oro—see page 346). Into the inlet of the sea between these hills the world-famous traders pushed their ships and built a city which has become the Palermo of to-day.

Photograph by A. W. Cutler

A GROUP OF SICILIANS IN A HOME FOR THE AGED POOR

children carrying strange devices made of plaited palm leaves. Last comes Saint George's lamp-lit float, a very meadow of standing flowers—carnations, hyacinths, asphodel—from amid which uprears the gigantic mail-clad saint astride his white horse, his long lance transfixing a prostrate dragon.

Under the unearthly light bathing this moon-kissed, candle-flickering procession, racial types start forth in the dark, Saracenic aspect of some man, in the Phœnician purity of profile of some woman.

"*Miracolo! Miracolo!*" whisper the spectators. And the sudden change of the drum dirge into a sprightly tempo and the joyous mood dawning on all faces proclaim that the miracle is resurrection. Ushered back from the tomb, George, the moon saint, lives again in full splendor, his phases of eclipse being symbolized by the slain dragon.

Then, strangest of all, the procession defiles downward through the ancient citadel gate to the near-by cemetery, where the long line of candlelights can be seen winding in and out among the cypresses. Perhaps the sleepers there will stir, ever so slightly, as Saint George passes by, even as his moon overhead is awakening the ocean tides.

Lastly, the procession remounts the hill. The somber drum dirge stirs anew; the spectators stand mute; all is funereal once more. You hold your breath as the cortege vanishes behind the church's closing doors. Saint George's yearly hour of life, his resurrection for one spring night, is over.

BATHS DATING FROM PINDAR'S DAY

At Lercara mountains and mine region ended together. A gradual descent of 2,000 feet through the valley of the Torto led us to the coast, where, nestled at the foot of a magnificent headland, lay the town of Termini Imerese.

After a week of inland travel through a country where bathtubs do not exist, our first question to the hotel manager was, "Is there, by any chance, hot and

ONE PURCHASES MILK IN SICILY "ON THE HOOF"

The milkman drives his cows, usually wearing gorgeously painted wooden collars depicting mythological or religious events or characters, up to the doors of the houses and produces the beverage "while you wait."

Photographs by A. W. Cutler

A SICILIAN FAMILY OUT FOR AN AFTERNOON DRIVE

The shawl worn by the man is a feature of the peasant's dress in winter. The *carretta*, or cart, commonly used by the Sicilians is constructetd so that it fits with striking exactness into the chariot ruts of old Roman days. It is usually built of carved oak ornamented with hammered metal work (see also illustration, page 308).

Photograph by A. W. Cutler

SANTO AND CAMELLA—SICILIAN SWEETHEARTS

"Black-eyed youngsters handed me a cactus apple and shrieked with delight when I found my mouth stinging with the almost invisible spines which clothe that fruit" (see text, page 311).

cold running water on the premises?"

He regarded us rather strangely; then led us downstairs to a tiled antechamber upon which opened innumerable cubicles containing marble bathtubs. Next he took us to an outhouse where, side by side, hot and cold springs were bubbling out of the earth.

"A thermal outfit on Sicily!" we gasped. "When was it established?"

"Some thousands of years ago," he replied modestly. "Termini's waters were quite fashionable in the days when Pindar wrote poems about them."

We gladly corroborate Pindar's eulogies upon these classic springs. Their effect, which almost makes one believe in the Fountain of Eternal Youth, is due to a rich mineral content, composed of seventeen constituents, as well as to their radioactive properties.

Termini, with its present population of 25,000, has the distinction of having contributed 15,000 emigrants to the United States. Lest the proportion sound fantastic, I may recall a certain Sicilian deputy's speech, wherein he pathetically referred to "My 30,000 constituents, most of whom have already emigrated and all of whom will eventually emigrate to the United States."

Photograph by F. Gallfi Crupi

CAPITALS OF THE COLUMNS ON THE CLOISTER OF THE BENEDICTINE MONASTERY AT MONREALE, NEAR PALERMO

Nothing of the original monastery now stands except the cloisters, which constitute the finest specimen of Italian-Romanesque architecture in existence. The 216 columns, arranged in pairs, are richly ornamented with designs which are varied and delicate in their execution. The effect produced is almost Moorish and the building is sometimes spoken of as a "monastic Alhambra."

TALKING "AMERICAN" IN SICILY

Nowadays the restrictive immigration law has modified what once bid fair to be a Sicilian exodus to our shores; yet hopeful applicants for visas still exceed Sicily's quota tenfold. The many hopefuls whom we encountered throughout the province of Palermo were often studying Italian-English vocabularies, from among whose "helpful phrases," for use in American cities, we culled the following:

"It is inadvisable for one of your charms to be out so late."

"The gentle lady Jones has deaded."

And what of the home-coming Sicilian

who, after twenty years of work in New York or Chicago, turns up with a bank account which looms large in Italian currency? We found the answer on every hand, where, all along that charming north Sicilian coast, these Sicilian-American capitalists had settled, causing its uncultivated spaces to blossom into lemon groves.

Half a century ago less than a hundred Sicilians emigrated per year; in 1913 a small army of 142,000 left the mother country, and in 1907-08 the returning flow of money from Sicilians overseas totaled $5,000,000. Tens of thousands of bank accounts, at Palermo, Messina, and elsewhere, represent the steady stream of remittances poured in by Sicilians resident in the United States.

And how heartily they greeted us, those landed proprietors who had once been plain Tony or Mike in America! And with what a wealth of genial profanity they conversed, conscious only of talking in trans-Atlantic vernacular! Said one of them:

"Gee, — —! You Americans? I ten years in Uni' States." (He made a frightful effort to pronounce Schenectady.) "Gee, — — fine town!" Then he stumbled over a rather complicated oath, and I prompted him in a whisper. "Dat's it!" he beamed. "Gee, if I ain't forgetting how to talk American!"

IN PALERMO, METROPOLIS OF SICILY

An hour's train-trip, with the sea on one hand and an almost unbroken expanse of lemon orchards on the other, brought us within the vast harbor curve where, in the cup of the surrounding mountains, lies Palermo. Small wonder that the ancient Greeks named the city, with its twelve-mile arc of bay, Panormus, or "All Harbor."

It was during the eleventh and twelfth centuries that Palermo reached its height of magnificence, under the Norman line of Roger and Robert de Hauteville, a magnificence which still dazzles one in such kingly gems as the Palatine Chapel and the cathedral at Monreale. It was with this period as a setting that Longfellow's poem of that too-worldly monarch, "King Robert of Sicily" was written.

Nowadays Palermo, with its 400,000 inhabitants, constitutes the delightful center of Sicily's Riviera, where one may hear excellent opera, or sip apéritifs in open-air cafés, or join the fashionable promenade along tree-shaded boulevards, where Paris fashions dominate, and dark, languorous faces reveal Sicilian beauty in its flower.

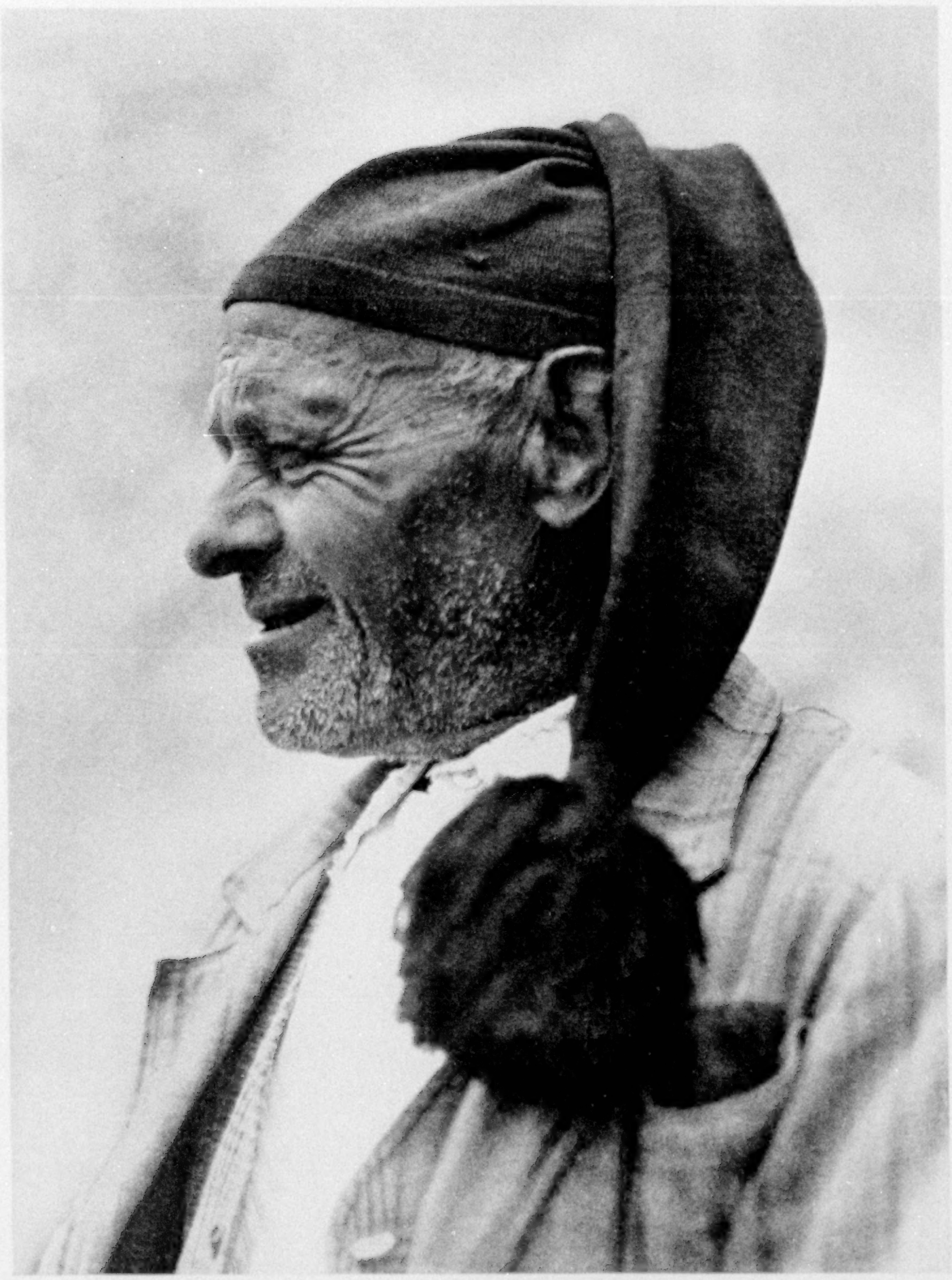
A childlike gaiety, as of an endless carnival week, reigns at Palermo. The cabman beams, touching his hat, over a twenty-cent fare. The many flower sellers tie their bouquets of blossoms atop of long poles, so that one seems to see walking clumps of roses threading the crowd. Seen in the markets, the peasant's two-wheeled cart is a splendidly colorful affair, its sides being painted with chromos of the Crucifixion, or of medieval combats, or of pirouetting ballet girls, while the accompanying horse is decorated with a feather duster of blue and scarlet plumes and with rows of tiny mirrors, designed to frighten off the evil eye.

Each street shrine of Saint Rosalia would rival a florist's window, and at nine in the morning one commonly sees business men passing in line before her, to deposit their votive bouquets, *en route* to their offices.

Saint Rosalia, by the way, having lived and died in a cave near Palermo, reappeared during a seventeenth-century plague, promising to abate the scourge if her bones were given Christian burial. The ceremony of conveying her relics through the streets takes place each July, while the accompanying regattas, horse races, and fireworks add a characteristic gusto. The Sicilians delight to greet their saints in much the same spirit as Americans display "Welcome-to-our-city" banners during political conventions.

SICILY'S LEMON BELT

Palermo's surroundings include the famous plain of Conca d'Oro, the most fertile region of Sicily, where rock-drilling and pumping stations have created an irrigation system which has increased the orange and lemon yield twentyfold. In 1922-23 Sicily produced 75,000 metric tons of lemons, well over one-half of this crop, $2,500,000 worth, being bought by the United States. Draw a line along the island's entire north coast to Messina,



A GRIZZLED SICILIAN

He has seen many districts of his island home almost depopulated by the tide of emigration flowing toward the United States. In one year (1913) 142,000 Sicilians came to America. Many have returned to their native land, while others have sent a constant stream of gold from Western shores to help the old folks at home (see text, page 346).

© Elmendorf

THE PUBLIC FOUNTAIN AT PIANA DEI GRECI

Though the fine masonry, more than a thousand years old, is crumbling, its original artistic design is evident. Piana dei Greci and five or six other towns of Sicily were founded during the latter part of the fifteenth century by Albanian Greeks who fled from their highland homes. They have kept their racial stock relatively pure and are known locally as Greci. Handsome old costumes are still worn by these inhabitants on certain festive occasions.

Photograph from Willard Price

TERRACE UPON TERRACE OF CLIFF DWELLINGS IN SICILY

In the mountain districts of some European countries, as well as in Asia and Africa, man has for centuries dug out his dwellings in the face of sheer cliffs, ranging in variety from marvelous rose-red Petra to the miserable dwellings of the Troglodytes of Tunisia. Often a natural cave or cleft in the rock is the starting point of such houses as these shown in the photograph.

© Elmendorf

ITALIAN TYPES IN SICILY

More than a dozen races have added their blood to the complex mixture which one finds in Sicily to-day. To the original races—the Sikians and Sikelians—Phœnician, Carthagenian, Saracen, Greek, Gothic, Vandal, Roman, German, French, Spanish, and Lombard infusions have been added. In Palermo the Arab types are common; in the southeastern provinces one often meets individuals with the regular features of the Greeks or the fair hair and blue eyes of the Lombards.

XUM

Photograph by A. W. Cutler

PEASANTS OF THE MOUNTAIN VILLAGE OF FORZA D'AGRÒ

As in most Sicilian mountain villages, the streets up the steep cliffs are flights of steps. Forza d'Agrò is adjacent to the beautiful cape of San Alessio.

then down the whole length of the east coast, and you will have demarked Sicily's lemon belt; and of this the richest spot is the Conca d'Oro.

To turn from Palermo's wealth to its poverty, one has but to thread its tortuous slums, where a suspicious eye peers at one through a sliding panel before the door is opened; where two housewives purchase and split a small fish between them, and the street call of "I buy hair!" resounds among the crazy tenements.

It is a lugubrious experience to watch the hair merchant testingly finger the magnificent braids of some growing girl; to hear the squalid bargaining over five *soldi* (one-fourth of a lira), more or less, before he snips the black locks into his basket.

"There! It will grow again in time for sweethearting," soothes the grandmother. "Dry your eyes, Tessa!"

To compute how many similar heartbreaks are represented by the 130 tons of human hair exported in 1922 by the western half of Sicily might make even a statistician weep.

IN THE THEATER OF MARIONETTES

But just around the corner one finds a cheerier side to the picture, in a humble square which contains the *Teatrino dei Piccoli*, or Little Theater for Little Folk. Outside, canvas roll-ups depict the terrific combats of Charlemagne's mail-clad paladins, and the criminal career of Giuseppe Bruno, from his first downward step to his execution. Inside, a ragged audience of boys and men are applauding each sword thrust, hissing the devil, or roaring over the donkey who kicks everybody in the stomach, according to what three unseen, felt-slippered men are doing with their dextrous fingers behind the back-drop of the diminutive stage.

Not all the movie stars in the celluloid heavens can tempt the Palermitan slum dwellers from their beloved marionettes. For them the serials of the cinema theater pale beside the six-months-long dramas whose words and business have been handed down by word of mouth for centuries. "Charlemagne and the Twelve Paladins," for example, stretches serially throughout an entire year. Not the delight of novelty, but that of classic familiarity, actuates the marionette "fan," and he will discourse learnedly of different productions and different operators just as a dramatic critic will compare, say, a long line of Hamlets.

We went behind the scenes to congratulate the marionette master, his wife and his four grown children, upon what the handbill described as "Greco's singing, dancing, and conjuring marionettes." It was, in fact, a professional family. The elderly father was setting the stage for the next performance; the two sons were repairing Charlemagne's battered armor; the two daughters were making costumes, and the mother was practicing incidental music. The entire *teatrino*, dolls and all, was the work of their hands.

Our kodaks came into play, and the promise of a set of photographs made the Greco family our fast friends. Indeed, Alessandro, one of the sons, insisted on guiding us across the town to where our steamship waited, while he discoursed volubly upon the ancient art of marionette play.

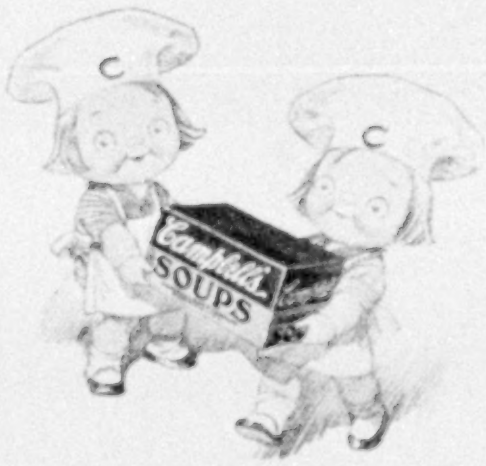
"How long does it take to learn?" he echoed, in answer to our question. "Why, signore, it must be in your fingers even before you are born. My grandfather—ah, there was a Christopher Columbus of marionette masters! Next, my father, who has practiced the art for fifty years; then myself, who cried for marionettes instead of dolls; and now my little son, who cannot yet walk, already he has the marionette strings in his hands."

"Would you like to take the show to America?" we asked.

"Ah, but yes!" he smiled radiantly and his fingers began plucking at invisible strings. "To play the Sicilian marionettes for the children of great America! Magnificent! Tell them so for me!"

And as we climbed aboard he waved a hand at us; then dramatically kissed it toward the sea horizon. And that was our last memory of Sicily and of its primitive, often lawless, yet always lovable, children, as he stood there, blowing kisses across the Atlantic to the children of the New World.

Who are the world's most famous soup chefs?



Beyond all contradiction
Through merit and through worth—
A truth that passes fiction—
Our soups go round the earth!

The public has answered. Year after year the demand for Campbell's Soups has so increased that today the great Campbell's kitchens stand unique, alone.

Chefs who devote their whole lives to blending fine soups. Kitchens no home could hope to possess. Ingredients that are literally the best money can buy.

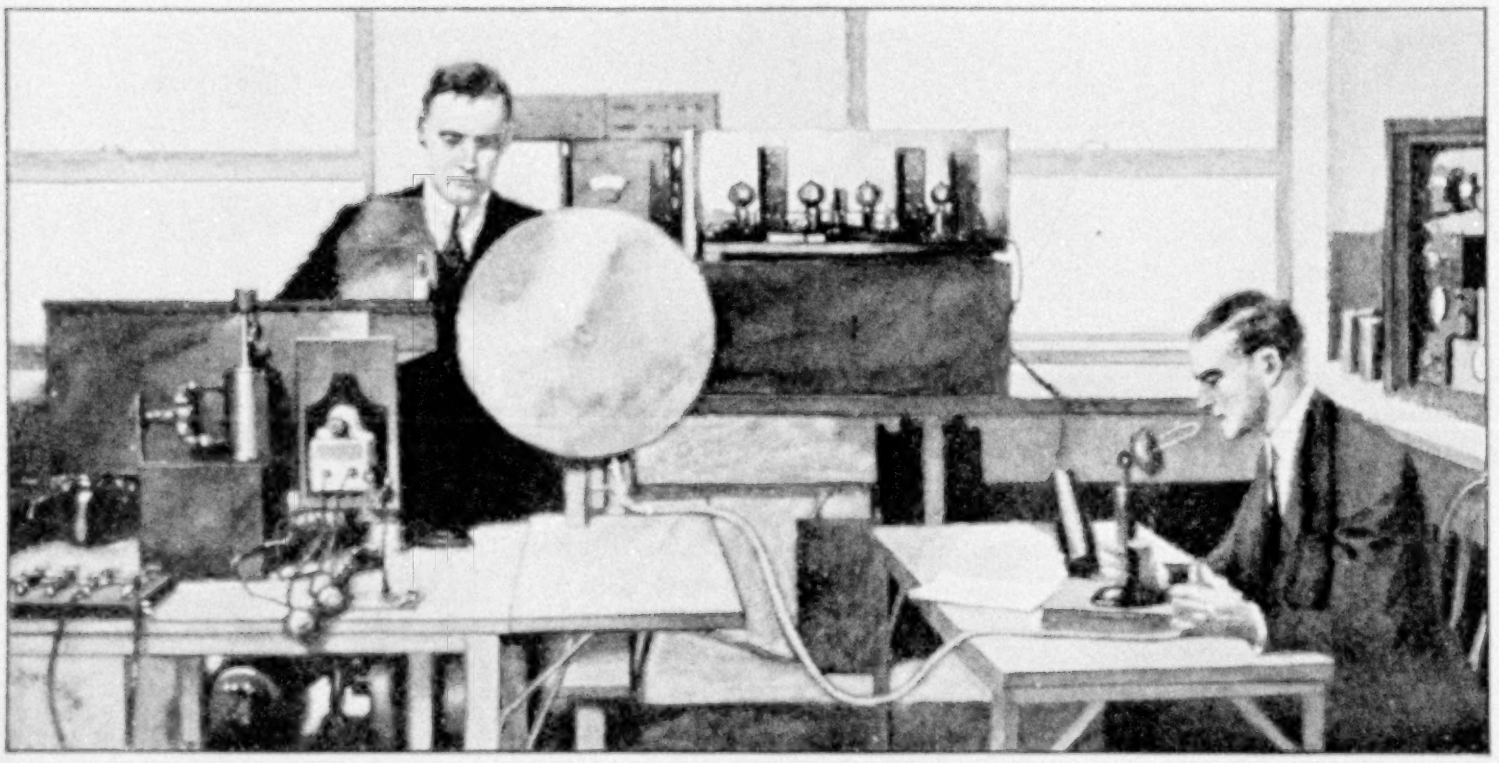
So now soup means something so much better that thousands of people who seldom ate soup before do not let a day go by without enjoying Campbell's!

Campbell's Tomato! See if it does not taste as good as its reputation! The blend of all that is delicious in the tomato, rich butter and tempting seasoning. Wonderful, too, when you cream it.

21 kinds 12 cents a can

Campbells' Soups

LOOK FOR THE RED-AND-WHITE LABEL



In the Bell System laboratories speech sounds are recorded on the oscillograph with a view to their subsequent analysis

The service of knowledge

The youthful Alexander Graham Bell, in 1875, was explaining one of his experiments to the American scientist, Joseph Henry. He expressed the belief that he did not have the necessary electrical knowledge to develop it.

"Get it," was the laconic advice.

During this search for knowledge came the discovery that was to be of such incalculable value to mankind.

The search for knowledge in whatever field it might lie has made possible America's supremacy in the art of the telephone.

Many times, in making a national telephone service a reality, this centralized search for knowledge has overcome engineering difficulties and removed scientific limitations that threatened to hamper the development of speech transmission. It is still making available for all the Bell companies inventions and improvements in every type of telephone mechanism.

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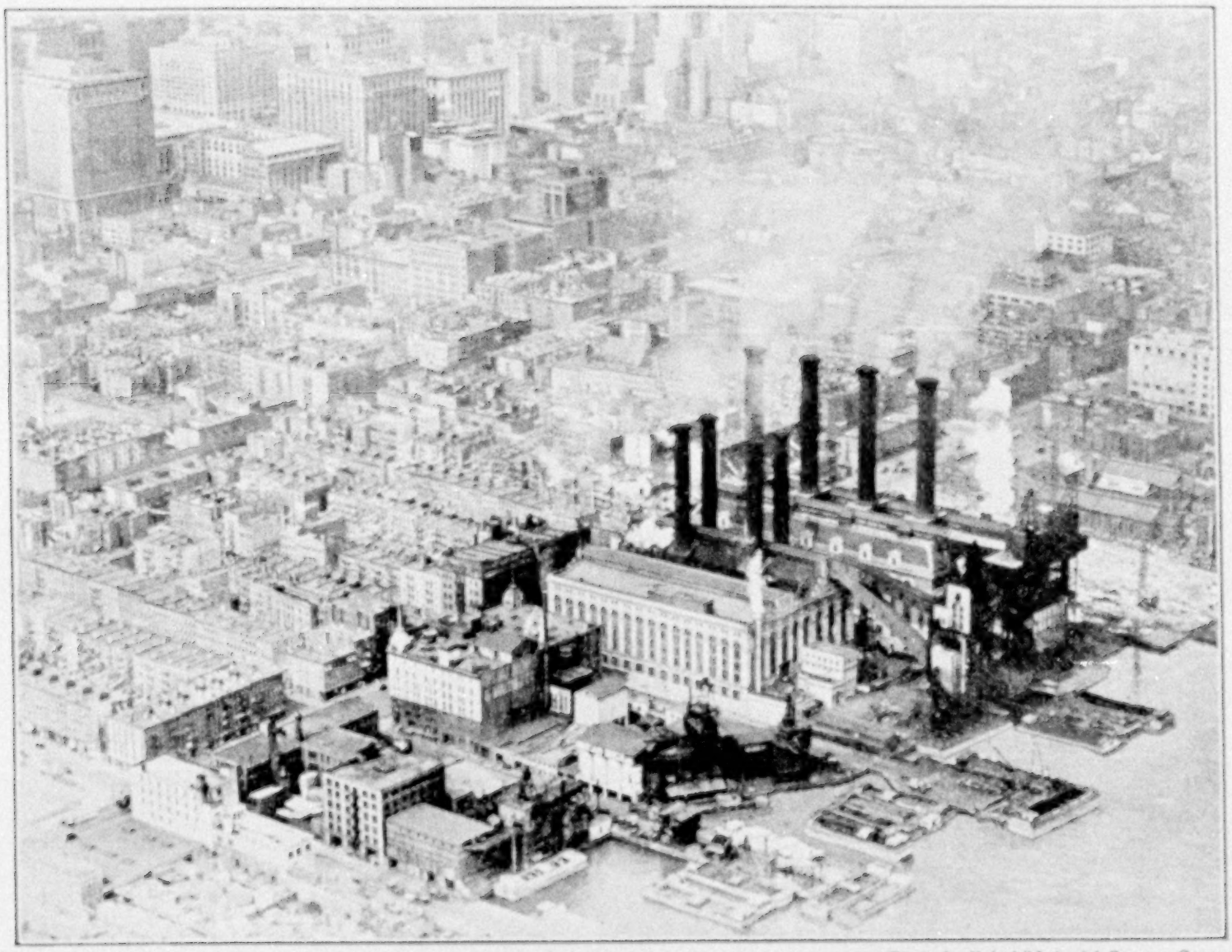

New York Edison Company's Power Station on East River at 38th Street

Photo by Fairchild Aerial Camera Corp.

BONDS—*of Public Utility Companies*

WHEREVER you go—in the hearts of cities—on the banks of rivers—you find central power stations of Public Utility companies, developing light, heat and power for nearby and distant industrial centers, towns and hamlets. Their service is in demand 24 hours a day, 365 days a year. They meet an essential and ever increasing need.

The National City Company is prepared to offer at all times carefully chosen, well secured Public Utility Bonds of liberal yield. Each one is recommended as a desirable investment. Further specific information by mail or at our nearest office.

THE NATIONAL CITY COMPANY

National City Bank Building, New York

You will find offices in more than 50 leading cities in the United States, Canada and abroad.

BONDS SHORT TERM NOTES ACCEPTANCES

Thousands use this fine stationery

AND such stationery! Both paper and envelopes are of National Bank Bond—a Butler paper, mind you—fine, clear, smooth. It welcomes the pen.

Your name and address appear, attractive yet dignified, in blue Gothic letters, a tasteful addition to stationery and a constant protection against mistakes.

Every woman should have a box of American Stationery in the home; it will serve you on almost all occasions; a wonderful convenience.

200
note sheets
100
envelopes
printed with your name and address
for $1.00

Send for a box of it today. We have no agents or dealers. We are serving over one million satisfied customers direct. Print your name and address as it is to appear, enclose with $1 and we will ship immediately, prepaid. Or, if you'd rather, we will gladly ship C. O. D.

Outside the United States and West of Denver, add 10% to your remittance.

With our prompt service goes our guarantee: we ship within a week. And if you are not satisfied, we will send the money back promptly.

AMERICAN STATIONERY COMPANY
FORD WALLICK, *President*
505 Park Avenue :: Peru, Indiana

Take a Kodak with you

Autographic Kodaks $6.50 up

Eastman Kodak Company, Rochester. N.Y., *The Kodak City*

Staying Young

THE age of a mother is not fixed upon the age of her children but by the fewness of years that show in her face and the number of smiles she uses each day to cling to her youth.

And the number of smiles that bring youth to the face may be many, indeed, if you wear just the right kind of shoes! For a comfortable foot means that important nerves are not pinched; there is no annoyance to draw back those smiles and replace them with wrinkle-forming frowns of discomfort.

Freedom from strained nerves, a liking for outdoor exercise, an active circulation—these are the conditions that prolong the beauty and the feeling of youth. Foster these happy attributes of youth and every smiling sky will be an acceptable invitation to go outdoors and walk and be healthy and happy.

Cantilever Shoes are helping many women to keep young. The graceful, natural lines of the shoe follow the contour of the foot with an easeful smoothness. The flexible Cantilever arch permits your foot muscles to build up springy strength and frees the circulation. Comfortable, springy feet will lead you to healthful, carefree activities.

Many women can tell you how Cantilever Shoes have given them a new disposition—more smiles per day, the fairy-like tendrils that bind you forever to youth.

Excellent workmanship, luxurious leathers and graceful lasts make Cantilever Shoes distinctly good looking. There is a fine variety of modish strap pumps and trim oxfords to select from.

If none of the dealers listed at the left is near you, write the manufacturers, Morse & Burt Co., 418 Willoughby Avenue, Brooklyn, N. Y. for the address of a nearer store.

Cantilever Shoe

Cantilever Stores

Cut this out for reference

Akron—11 Orpheum Arcade (Main & Market)
Albany—Hewett's Silk Shop, 15 N. Pearl St.
Allentown—907 Hamilton St.
Atlanta—126 Peachtree Arcade
Atlantic City—2019 Boardwalk (near Shelburne)
Baltimore—325 North Charles St., 2nd floor
Bangor—John Conners Shoe Co.
Binghamton—Parlor City Shoe Co.
Birmingham—219 North 19th St.
Boise—The Falk Merc. Co.
Boston—109 Newbury St., cor. Clarendon St.
Bridgeport—1825 Main St. (2nd floor)
Brooklyn—516 Fulton St. (Primrose Bldg.)
Buffalo—641 Main St. (above Chippewa St.)
Burlington, Vt.—Lewis & Blanchard Co.
Charlotte—226 North Tryon St.
Chicago—162 N. State St. (opp. Chicago Theatre)
1650 Leland (near Broadway)
6410 Cottage Grove Ave. (Woodlawn)
Cincinnati—The McAlpin Co.
Cleveland—1705 Euclid Ave.
Columbus, O.—104 E. Broad St. (at 3rd)
Dallas—Volk Bros. Co.
Dayton—The Rike-Kumler Co.
Denver—224 Foster Bldg.
Des Moines—W. L. White Shoe Co.
Detroit—41 E. Adams Ave.
Duluth—107 West First St. (near 1st Ave., W.)
Elizabeth—258 No. Broad St.
Evanston—North Shore Bootery
Evansville—310 So. 3rd St. (near Main)
Fort Wayne—Mathias Agg's Sons
Fort Worth—Washer Bros.
Grand Rapids—Herpolsheimer Co.
Harrisburg—26 No. 3rd St. (second floor)
Hartford—Trumbull & Church Sts.
Houston—205 Foster—Bank Commerce Bldg.
Huntington, W. Va.—McMahon-Diehl
Indianapolis—L. S. Ayres & Co.
Jacksonville, Fla.—24 Hogan St. (opp. Seminole Hotel)
Jersey City—Bennett's, 411 Central Ave.
Kansas City, Mo.—300 Altman Bldg.
Knoxville—Spence Shoe Co.
Lincoln—Mayer Bros. Co.
Long Beach, Cal.—536 Pine Ave.
Los Angeles—905 New Pantages Bldg.
Louisville—Boston Shoe Co.
Lowell—The Bon Marche
Madison—Family Shoe Store
Memphis—28 No. Second St.
Milwaukee—Brouwer Shoe Co.
Minneapolis—25 Eighth St. South
Montreal—Keefer Bldg. (St. Catherine, W.)
Mt. Vernon, N. Y.—A. J. Rice & Co.
Nashville—J. A. Meadors & Sons
Newark—897 Broad St. (2nd floor)
New Bedford—720 Pleasant St.
New Brunswick—A. V. Harding & Sons
New Haven—153 Court St. (2nd floor)
New Orleans—109 Baronne St. (Room 200)
New York—14 W. 40th St. (opp. Public Library)
2950 Third Ave. (152nd St.)
Norfolk—Amies & Brownley
Oakland—516-15th St. (opp. City Hall)
Oklahoma City—Fetler's Boot Shop
Omaha—1708 Howard St.
Pasadena—378 E. Colorado St.
Passaic—37 Lexington Ave.
Paterson—10 Park Ave. (at Erie Depot)
Pawtucket—Evans & Young
Peoria—Jefferson St. (Lehmann Bldg.)
Philadelphia—1932 Chestnut St.
Pittsburgh—The Rosenbaum Co.
Pittsfield—Wm. Fahey's, 214 North St.
Plainfield—M. C. Van Arsdale
Portland, Me.—Palmer Shoe Co.
Portland, Ore.—353 Alder St.
Providence—The Boston Store
Reading—Sig. S. Schwerimer
Richmond, Va.—Seymour Sycle
Roanoke—I. Bachtsch Shoe Co.
Rochester, N. Y.—287 Main St., E. (3rd floor)
St. Joseph, Mo.—216 N. 7th (Arcade Bldg.)
St. Louis—524 Arcade Bldg. (opp. P. O.)
St. Paul—43 E. 5th St. (Frederic Hotel)
Sacramento—208 Ochsner Bldg., K near 7th
Saginaw—Goeschel-Kuiper Co.
Salt Lake City—Walker Bros. Co.
San Diego—The Marston Co.
San Francisco—127 Stockton St.
San Jose—Hoff & Kayser
Schenectady—443 State St.
Scranton—Lewis & Reilly
Seattle—Baxter & Baxter
Sioux City—The Pelletier Co.
Spokane—The Crescent
Springfield, Mass.—Forbes & Wallace
Syracuse—121 West Jefferson St.
Tacoma—259 So. 11th St. (Fidelity Bldg.)
Toledo—LaSalle & Koch Co.
Toronto—7 Queen St. East (at Yonge)
Trenton—H. M. Voorhees & Bro.
Troy—53 Third St. (2nd floor)
Tulsa—Lyon's Shoe Store
Utica—28 & 30 Blandina St., cor. Union
Vancouver—Hudson's Bay Co.
Washington, D. C.—1319 F Street (2nd floor)
Wheeling—Geo. R. Taylor Co.
White Plains—Gedney Boot Shop
Wilmington, Del.—Kennard-Pyle
Winnipeg—Hudson's Bay Co.
Worcester—J. C. MacInnes Co.
Yonkers—22 Main St.
Youngstown—B. McManus Co.

Agencies in 455 other cities

Never Before

So much for the Price Walter P. Chrysler Says

It is not only in engineering design—in performance—that the good Maxwell now revolutionizes four-cylinder standards.

Never was there a car which gave the owner so much in fine materials and workmanship for anywhere near the price.

You can depend upon the good Maxwell to stand up in toughest, day-after-day going—you can drive it with the same assurance you would feel with a costly car.

Perhaps the greatest boon to the good Maxwell owner, however, is the consistently care-free service it gives him, day after day and month after month.

There are a host of mechanical reasons why the good Maxwell saves its owners both trouble and expense. Here are a few:

1 Fine bearings, used extensively, eliminate friction. (With one hand you can roll the car on a level floor.)

2 The crankshaft floats on a film of force-feed oil, maintained under pressure in its three extra large bearings. This reduces wear to the point where there is practically no need for bearing replacement.

3 The clutch release or throwout bearing is positively and automatically lubricated from the transmission.

4 At all vital points the good Maxwell uses the same kinds of alloy and heat treated steels employed in the costliest cars.

5 The rear axle drive pinion—which bears the burden of propelling the car—is rigidly mounted on ball bearings which preserve permanent alignment and quietness.

6 The frame side rails are of unusually deep sections which insure great strength and rigidity.

I would like you to ride in the good Maxwell, now that Chrysler engineers are directing its development. I would still more like to have you talk with owners and learn their disinterested opinion of good Maxwell performance and economy.

W. P. Chrysler

President and Chairman of the Board
MAXWELL MOTOR SALES CORPORATION, DETROIT, MICH.
MAXWELL-CHRYSLER MOTOR CO. OF CANADA, LTD. WINDSOR, ONT.

MAXWELL

Touring - - -	$ 895
Sport Touring -	1055
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All Prices F. O. B. Detroit subject to current government tax.

All Maxwell dealers are in position to extend the convenience of time-payments. Ask about Maxwell's attractive plan.

The Good MAXWELL

XUM

The Pen of Accomplishment

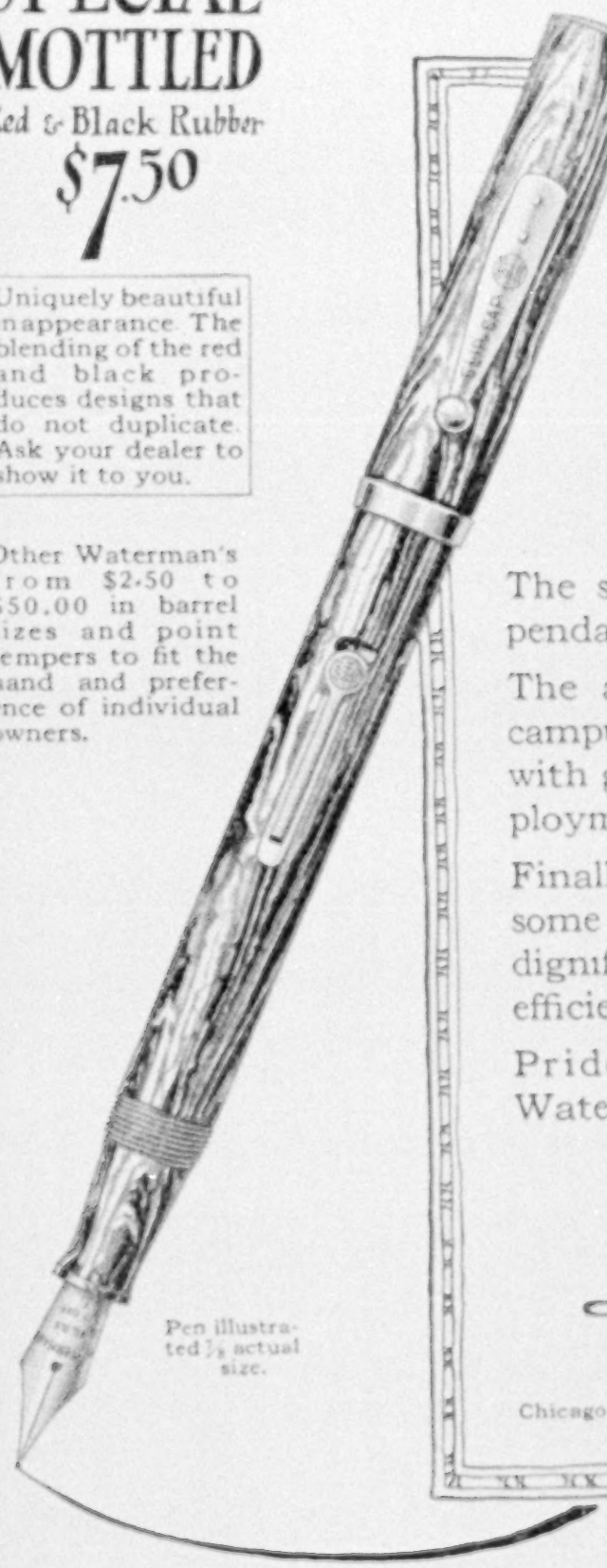
Waterman's Ideal Fountain Pen

"The Daddy of Them All"

SPECIAL MOTTLED
Red & Black Rubber
$7.50

Uniquely beautiful in appearance. The blending of the red and black produces designs that do not duplicate. Ask your dealer to show it to you.

Other Waterman's from $2.50 to $50.00 in barrel sizes and point tempers to fit the hand and preference of individual owners.



Pen illustrated ⅔ actual size.

Every age in pen-ownership has its appropriate

Waterman's Ideal Fountain Pen

The sturdy pen of school day utility, dependable aid to neatness and accuracy

The appreciated companion of office and campus hours—a pen selected to keep pace with growing hands and more exacting employment.

Finally, the insignia of success—the handsome gold mounted pen of the man of affairs, dignified as his treasured time piece and as efficiently ready for instant call.

Pride of possession goes with every Waterman's Pen that's sold.

Selection and Service at Best Dealers Everywhere

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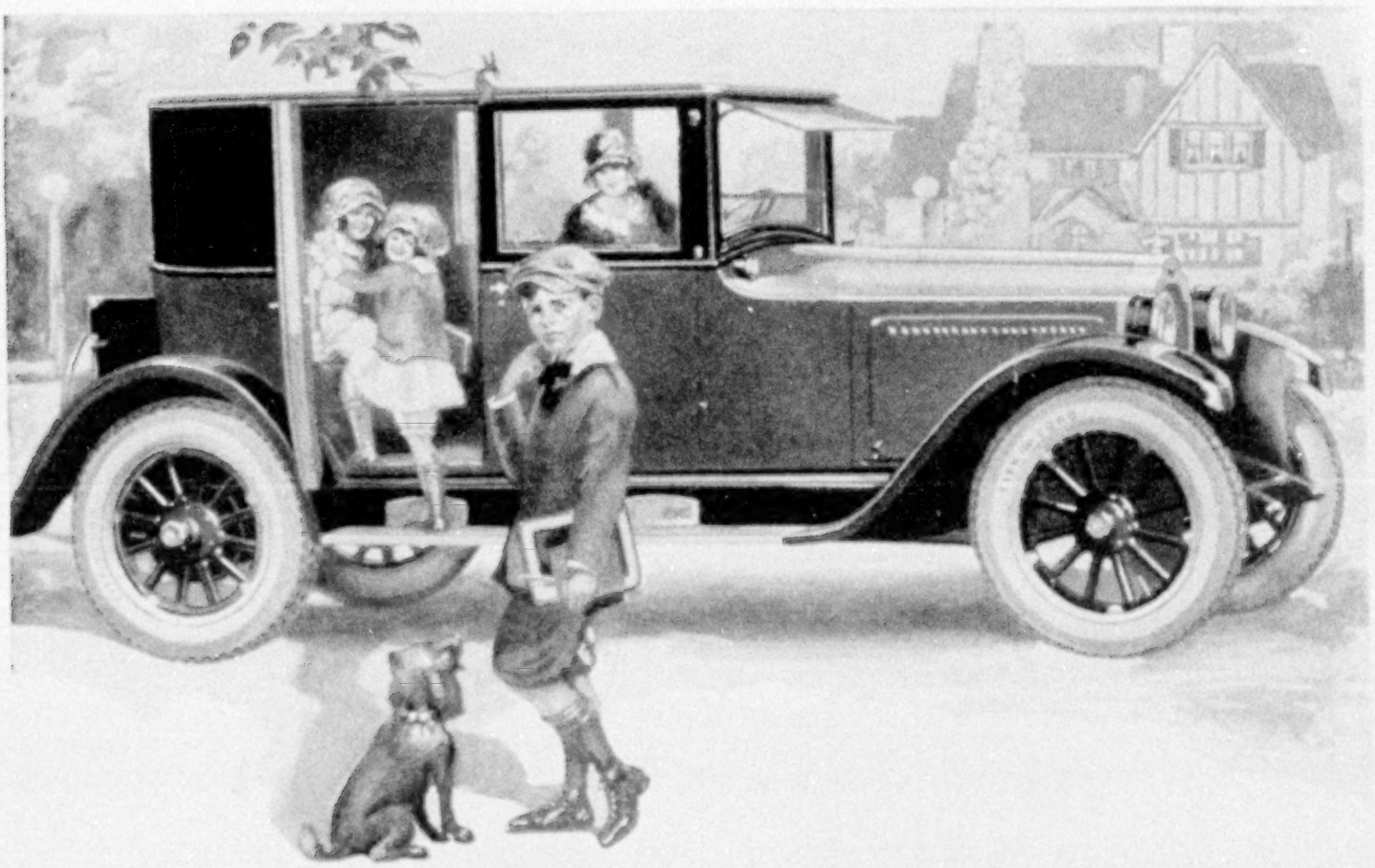
Waterman's Ideal Ink—Best for fountain pens and general use. Writes blue, dries black.



Memorable Days in a Knight

On school days, on shopping days, on Sundays, on all days of the calendar, season in and season out, the Willys-Knight Coupe-Sedan is keeping owners young and happy—a family car faithful to every trust, and as smart as Fifth Avenue!

This is the car that made folding seats as old-fashioned as haircloth furniture. Doors both *front* and *rear* let everybody enter and leave without climbing over seats or feet. A Wilson-built-Body—with the *capacity* of a sedan and the *sociability* of a coupe—finished in a beautiful color scheme of blue, black and nickel.

Coupe-Sedan
$1550
F O B TOLEDO

As fine as it looks, it is yet finer internally. The Willys-Knight sleeve-valve engine *actually improves with use*—supremely smooth and quiet. No valve-grinding. No bother with carbon. Owners report 50,000 miles and more without once having had a mechanic tinker with the engine.

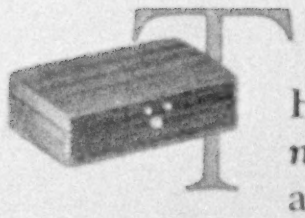
There is a definite social distinction in owning a Willys-Knight . . . and everlasting satisfaction in its performance. The greater the mileage you drive the more you enjoy the driving—and the more value you attach to the car. Try a Knight on the road today!

Willys-Knight Models: 2-pass. Roadster $1175, 5-pass. Touring $1195, 7-pass. Touring $1325, 5-pass. Sedan $1695 (DeLuxe $1895), 7-pass. Sedan $1995: f.o.b. Toledo. We reserve the right to change prices and specifications without notice.

Willys-Overland, Inc., Toledo, Ohio • Willys-Overland Sales Co. Ltd., Toronto, Canada

WILLYS-KNIGHT

XUM



THE *absolutely new* mechanical advantages of the New Improved Gillette make a perfect shave the most natural thing in the world, and the sum you spend for this new razor your best investment. It is the last razor you will have to buy! Do it—today.

Whether you have a beard "like wire" or as soft as silk, your GOOD shave will become a PERFECT shave if you read "Three Reasons"—a new shaving booklet just published. A postcard request and we'll gladly send you a copy with our compliments.
Gillette Safety Razor Co.
Boston, Mass.

$5 to $75

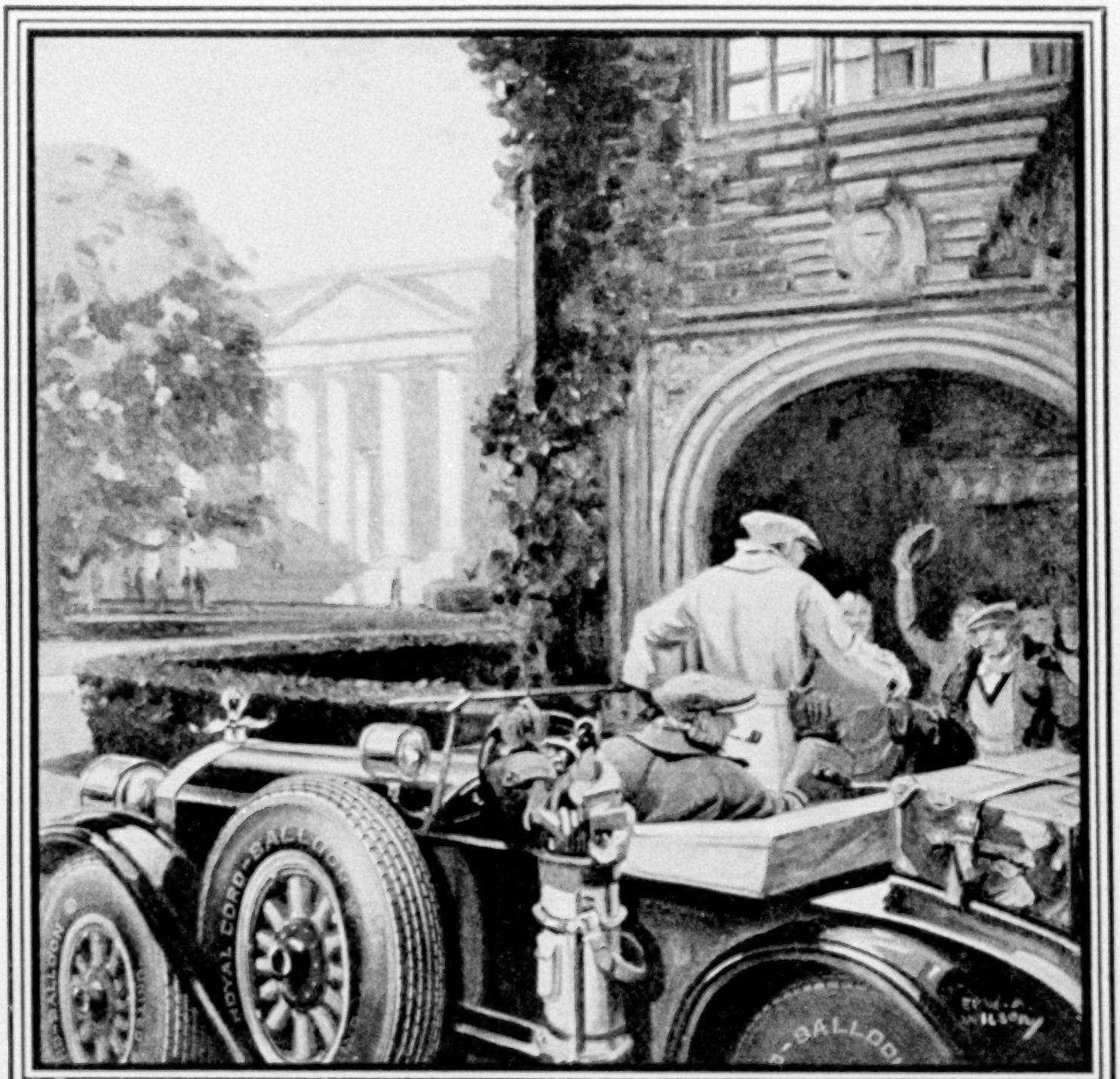
The New Improved

Gillette

SAFETY Gillette RAZOR

The Gillette Big Fellow
In Silver Plate, $5
In Gold Plate, $6

GILLETTE SAFETY RAZOR CO., BOSTON, U.S.A.



U. S. Royal Cord Balloon Tires give a car owner all the advantages of low air-pressure tire equipment plus certain distinct advantages of their own.

They are—

1—Accurate balance

2—Special tread scientifically designed for flexible side-wall low air-pressure tires.

3—Latex-treated cord construction—developed, patented and owned by the makers of U. S. Tires.

Taken together they provide additional safety at high speeds—easier handling at all speeds—easier steering at low speeds—greater flexibility and strength—a necessary requisite of low air-pressure tire equipment.

U. S. Royal Cord Balloon Tires are made for 20 and 21 inch rims.

U. S. Royal Cord Balloon-Type Tires for the larger wheel and rim equipment on cars not originally equipped with balloon tires.

Trade Mark

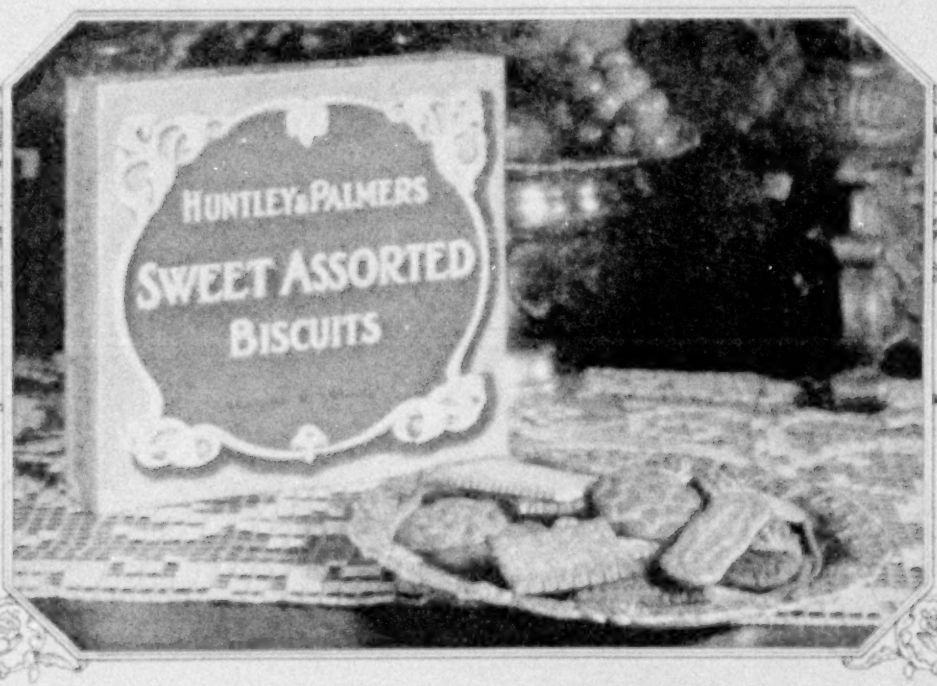
United States Rubber Company

U.S. Royal Cord Balloon Tires

Built of Latex-treated Cords

UNITED STATES TIRES ARE GOOD TIRES

HUNTLEY & PALMERS BISCUITS



By appointment to H.M. King George V.

H.M. The King of the Belgians

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Special Introductory Package of these Famous Biscuits for One Dollar.
Every morsel of the twelve palate-tempting flavors reminds you of that worthy expression, "The Sweetmeats of Kings."
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THE VOSE PIANO

represents 70 years of experience devoted to the attainment of an ideal. Its incomparable tone brings a lifetime of satisfaction to the lover of good music. And its price is moderate.

WE CHALLENGE COMPARISONS.
Write for illustrated catalog and easy monthly terms of payment.
Vose & Sons Piano Co., 146 Boylston St., Boston

"Made By HEISEY"

Thousands of women, thrice daily pay tribute to the fascination and unusual wearing qualities of *Heisey's Glassware*, by using it in their homes. You, too, will take pride and save money by its use.

At the better stores or write

A. H. HEISEY & CO.
DEPT. N-3 NEWARK, OHIO

Enjoy

for ten days this new way of teeth cleaning

Accept this offer for the sake of safer, prettier teeth. It means new beauty, new delights, new cleanliness. It has brought those benefits to people all about you, whose whiter teeth you see.

That cloud is film

Teeth are clouded by a film—that viscous film you feel. Under old-way brushing much of it clings and stays. It becomes discolored, forms dingy coats, hides the luster of the teeth.

Film also holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay. Germs breed by millions in it. They, with tartar, are the chief cause of pyorrhea.

Few escaped such troubles under old ways of teeth cleaning.

Now dental science has found two ways to fight film. One disintegrates the film, one removes it without harmful scouring.

Able authorities have proved the methods effective. A new-type tooth paste has been created to apply them daily. The name is Pepsodent. Today millions of people of some 50 nations employ it, largely by dental advice.

Great changes come

Pepsodent also multiplies the alkalinity of the saliva, also its starch digestant. Those are great tooth-protecting factors. These combined effects will bring results to delight and amaze.

Send the coupon for a test. Note how clean the teeth feel after using. Mark the absence of the viscous film. See how teeth become whiter as the film-coats disappear.

You will always use it when you know.

Protect the Enamel

Pepsodent disintegrates the film, then removes it with an agent far softer than enamel. Never use a film combatant which contains harsh grit.

PAT. OFF.
Pepsodent
REG. U.S.

The New-Day Dentifrice

Based on modern research. Now advised by leading dentists the world over.

CUT OUT THE COUPON NOW

10-DAY TUBE FREE 1615

THE PEPSODENT COMPANY
Dept. 154, 1104 S. Wabash Ave., Chicago, Ill.
Mail 10-Day Tube of Pepsodent to

Only one tube to a family.

"The Shower certainly does relieve my fatigue"

HOW many persons have said or thought this after having put in a shower? For the shower *does* relieve fatigue and tiredness.

Showers, too, are often beneficial in cases involving the nervous system. Taken before going to bed, a warm shower will usually induce quiet, restful sleep and a cold shower always stimulates.

You can see why then it is said that the shower is *more than just a bath.* However, the shower, because it uses the water only once, *is* the *clean* way of bathing.

There's a type of shower made for every bath room. We have booklets showing these types. We also have a new booklet quoting authorities on the use and benefits of the shower. Its title is "Authorities Agree." We'll gladly send both. In writing, please mention your plumber's name.

SPEAKMAN COMPANY
Wilmington, Delaware

SPEAKMAN SHOWERS

THE MODERN BATH ROOM HAS A SHOWER

Go by a Canadian Pacific Empress
to the
ORIENT

A RICKSHA man waits to to carry you down the lantern-lit streets; the temple bells are calling.

You can be in Japan in ten days—then China and Manila.

And it costs no more to travel by the largest, fastest and finest steamers on the Pacific—the Empress Liners, sailing fortnightly from Vancouver, B. C.

Wide promenade decks. Unusually attractive staterooms. Lounges. Music. Dancing. Radio. And the most interesting companions in the world—for the Canadian Pacific is the first choice of world travelers, both on account of the excellence of the service, and the speed of the ships.

Canadian Pacific

IT SPANS THE WORLD

Offices and Agencies in all parts of the Globe

COLGATE'S

Shaving Stick

"HANDY GRIP" AND REFILL

For Comfort, Convenience, and Economy

When we say to you that the Shaving Stick has important advantages over shaving preparations in any other form, we can do so without bias, for we manufacture shaving sticks, powder and cream.

In its attractive nickel box, our "Handy Grip" Shaving Stick is most convenient for traveling. It will not crush when packed, and it makes a wonderful lather for *easy* shaving.

It is not uncommon for a Colgate Shaving Stick to last more than a year in daily use.

The famous "Handy Grip", with a trial-size shaving stick in nickel box, sent for 10c. When the trial stick is gone, buy Colgate "Refills" for the price of the soap alone, 25c.

COLGATE & CO. Dept. 66, 199 Fulton St. NEW YORK

Imperial Tables

Grand Rapids

Distinguished Imperial Tables, in historic designs and fine woods, are for those who delight to enrich their homes with creations of enduring beauty. At leading stores you will find special Imperial displays.

IMPERIAL FURNITURE CO., Grand Rapids, Mich.
"World's Largest Table Factory"

Write Dept. G for beautiful booklet, "Heirlooms of Tomorrow", on the uses of tables. State name of your furniture store.

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Occupation.....
(This information is important for the records.)

Address.....

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for membership in the Society.

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Name and Address of Nominating Member

9-24

The Dining Room—pride of your home; cheerful, mellow, with every detail contributing to the happy feeling of confidence. When friends come to enjoy your hospitality and good cheer, then you are grateful for that confidence, which only good furnishings can promote. In such a harmonious atmosphere of genial warmth and refinement both heart and palate are most responsive. You appreciate your beautiful rug—your Karnak, soft and mellow in its faithful reproduction of an oriental masterpiece. No false note here, for Karnak is at home in the finest surroundings.

Send 25c for 9 x 12 inch miniature Karnak Rug, an ideal gift for the children's doll houses. Our authoritative booklet "Beautifying the Home" will be sent on request to Karnak Adv. Dept., W. & J. Sloane, 581 5th Ave., New York.

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BEAUTY WHERE PRIDE DEMANDS IT

Conrad Nagel, "Goldwyn" Star

Patrick DULUTH HAND TAILORED OVERCOATS

Distinctive

Refined design, faultless fit, exquisitely hand-tailored. Their distinctive feature is the beautiful Patrick-Duluth Cloth, noted for its rich texture, exclusive patterns and enduring wear.

At leading clothiers. Write for sample of this wonderful cloth — also Style booklet. (Address Desk 16).

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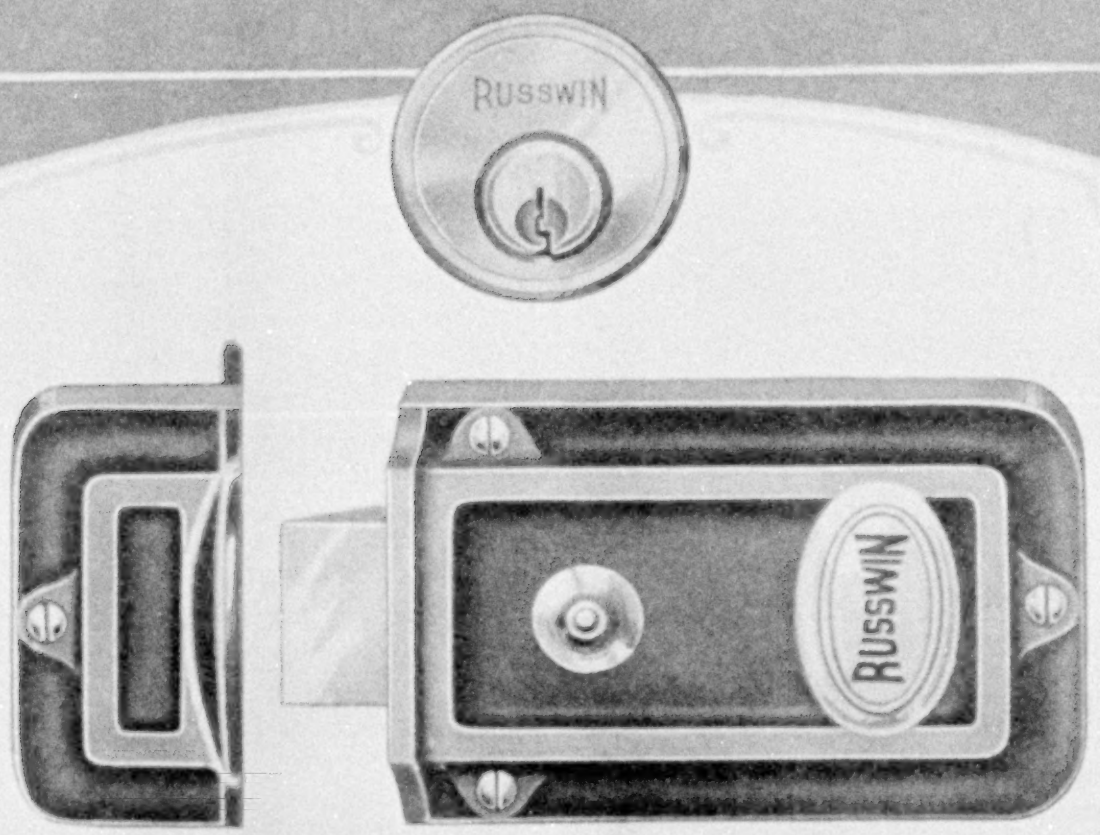
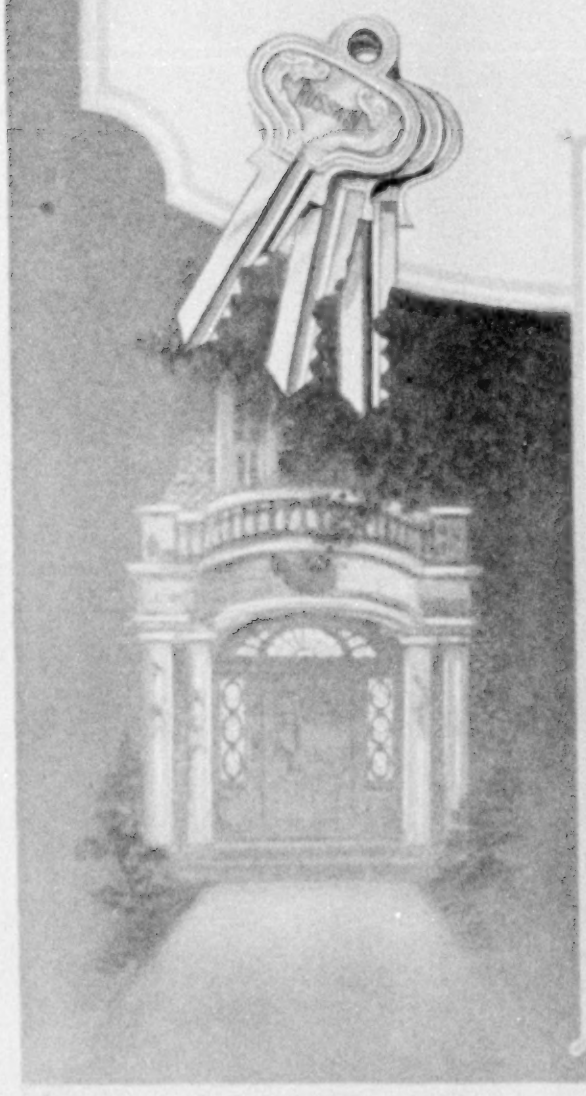
"PURE NORTHERN WOOL from sheep that thrive in the snow"

Deaf Can Hear Says Science

New Invention Aids Thousands

Here's good news for all who suffer from deafness. The Dictograph Products Corporation announces the perfection of a remarkable device which has enabled thousands of deaf persons to hear as well as ever. The makers of this wonderful device say it is too much to expect you to believe this, so they are going to give you a chance to try it at home. They offer to send it by prepaid parcel post on a ten-day free trial. They do not send it C. O. D.—they require no deposit—there is no obligation. They send it entirely at their own expense and risk. They are making this extraordinary offer, well knowing that the magic of this little instrument will so amaze and delight the user that the chances of its being returned are very slight. Thousands have already accepted this offer and report most gratifying results. There's no longer any need that you should endure the mental and physical strain which comes from a constant effort to hear. Now you can mingle with your friends without that feeling of sensitiveness from which all deaf persons suffer. Now you can take your place in the social and business world to which your talents entitle you and from which your affliction has, in a measure, excluded you. Just send your name and address to the Dictograph Products Corporation, 1311 Candler Bldg., 220 W. 42nd St., New York, for descriptive literature and request blank.





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Instantly, whenever it recognizes the familiar touch of its own particular key, the Russwin Night Latch unlocks.

But to strange keys and to other methods of persuasion this small, silent guardian of your door is forever opposed—a characteristic of Russwin locks, which has made the name Russwin known for more than eighty years as the symbol of perfect security.

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The American Hardware Corporation
Successor
New Britain, Connecticut

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San Francisco
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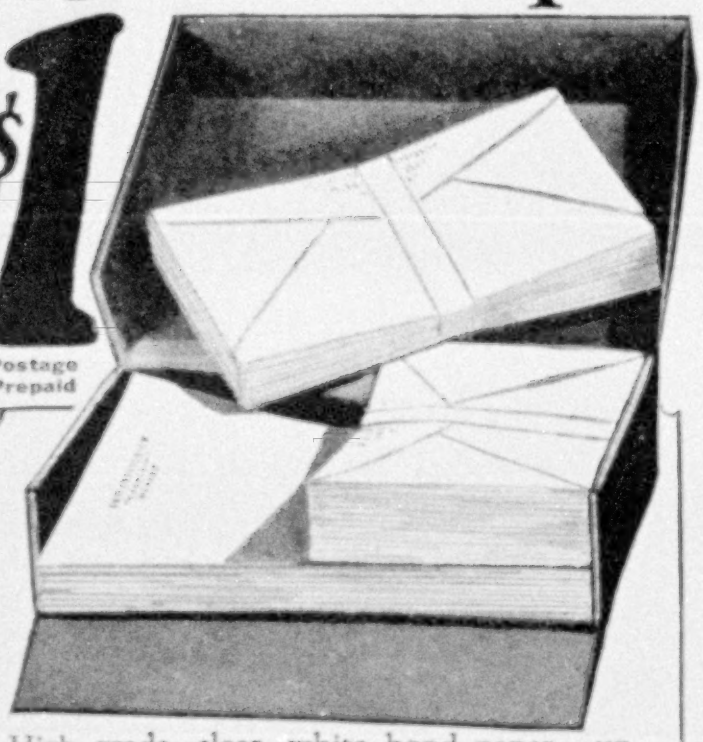
"To Russwin-ize is to Economize — The Economy of the Best."

200 Sheets 100 Envelopes

$1

Postage Prepaid



High grade, clear, white bond paper—unusually smooth writing surface. Size 6x7 inches with envelopes to match. We give you much superior quality stationery at this low price as we sell this item only.

Your Name and Address Printed FREE

on every sheet and envelope, in rich dark blue, up to 4 lines. (Note—our low price does not allow any variation in printing. Top center of sheet and flap of envelope only). Type is Plate Gothic, designed especially for clearness and good taste. Makes a personal stationery you will be delighted to use.

Just send your name and address on the coupon below (write or print clearly) with $1.00 (west of Denver and outside of the U. S. $1.10) and this generous box of stationery will come to you neatly packed, postage prepaid. Money refunded if you are not more than satisfied. Order today!

National Stationery Co. 1556 Lincoln Highway, Batavia, Illinois.

Gentlemen—I enclose $1.00 ($1.10 for shipments west of Denver or outside U. S.) for which please send me postage prepaid, 200 sheets and 100 envelopes of National Stationery with my name address printed on each as follows:

.....

.....

.....

.....

To avoid errors please Write or Print Clearly

MONGOL PENCIL

The superior lead that has made the Mongol such a fine writing pencil is exclusive with the Mongol Pencil—

The Nation's Standard

Eberhard Faber

The Oldest Pencil Factory in America

NEW YORK

Look for the BLACK TIP *with* GOLD BAND

"In a class by itself"

Correction of an error

On the 4th left-hand page following text of the June issue of this magazine there appeared an advertisement of Krementz links. Through a typographical error, these links were described as "18 kt. white gold."

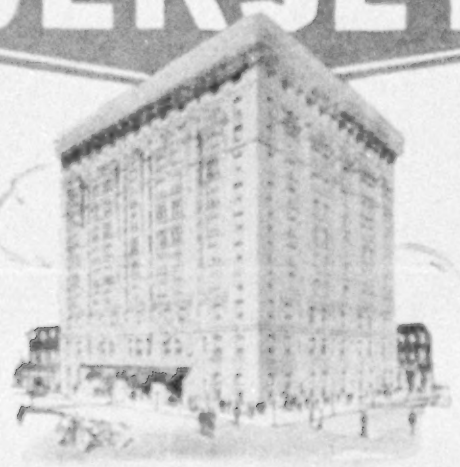
This description should have read "18 kt. white gold *plate*."

We regret the error sincerely and take this means of correcting it.

KREMENTZ & CO.
Newark, New Jersey

TRADE **JERSEY** MARK

Lincoln School
Birdsboro, Penna.



Hotel Monteleone
New Orleans, La.

Excelsior Masonic Temple
Milwaukee, Wis.

Arthur J. Tomlinson
Wood Stock, N. Y.

They're All Screened With Jersey

Here are a few buildings that have been equipped with screens made of Jersey Copper Insect Screen Cloth.

F. D. White
Riverside, Conn.

Owners, builders and architects who have studied the screen cloth question are agreed that—

Jersey Copper Screen Cloth will last—because it is made of the most durable metal in common use—copper 99.8% pure. Its quality has been thoroughly tested by many years of service under the severest climatic conditions.

Jersey Copper Screen Cloth will not stretch or bulge. The copper wire used is made by a special Roebling process which gives it stiffness and strength comparable to that of steel.

Jersey Copper Screen Cloth is adaptable to every type of building.

Jersey in dark finish is the best material to use in making door, window or porch screens for residences of all types, schools, hospitals, public buildings, etc.

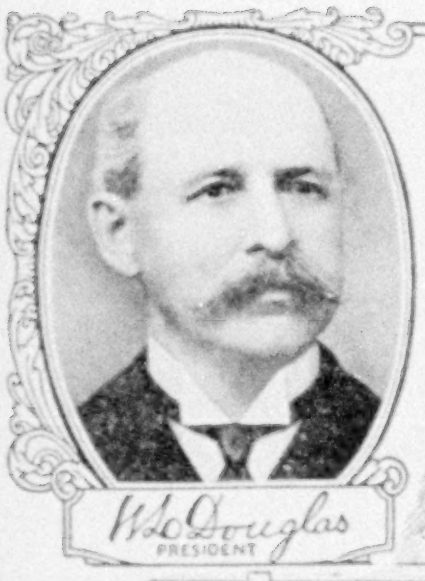
Talk to your hardware merchant or custom-made screen maker about Jersey Copper Screen Cloth. If he does not stock it, write us and we will send you a sample, also an interesting booklet and advise you how you can get it.

TRADE JERSEY MARK

THE NEW JERSEY WIRE CLOTH COMPANY
632 South Broad Street
Trenton New Jersey

Copper Screen Cloth

Made of Copper 99.8% Pure



W·L·Douglas

$5, $6, $7 & $8 SHOES

BOYS AT $4.50 & $5.00

Women of fashion should know that we have in our stores a most attractive display of distinctive, up-to-date Women's shoes in exclusive styles which appeal to those who desire stylish and comfortable shoes at reasonable prices.

Fall Style
for Women
In Cherry Red Russia. Also in Velour Calf for women who prefer Black leather.
$6.00

W. L. DOUGLAS PEGGING SHOES AT 7 YEARS OF AGE

New Brogue
for Men
A late broad-toe last with soft box in Black Velour Calf. Also in light Russia Calf.
$7.00

WEAR W. L. DOUGLAS SHOES AND SAVE MONEY

FOR 38 YEARS, W. L. Douglas' name and portrait have stood for quality, for economy and for satisfactory service. W. L. Douglas shoes are exceptionally good values. Only by wearing them can you appreciate their superior qualities. ***Such quality, comfort and service are rarely found in other makes at our prices.***

THE EXCLUSIVE, smart models, designed especially for young men and women, are the leaders. ***Seldom have you had the opportunity to buy shoes of such wonderful value as you will find in the W. L. Douglas $7.00 shoes*** in our retail stores in the principal cities, and in good shoe stores everywhere.

WHEREVER YOU LIVE, demand W. L. Douglas shoes. They are sold in 120 of our own stores and by over 5,000 shoe dealers. For economy and dependable value, ***wear shoes that have W. L. Douglas' name and the retail price stamped on the soles.*** The stamped price guarantees the value. If they are not for sale in your vicinity, write for catalog.

W. L. Douglas Shoe Company, 130 Spark St., Brockton, Mass.

CENTURY SHEET MUSIC

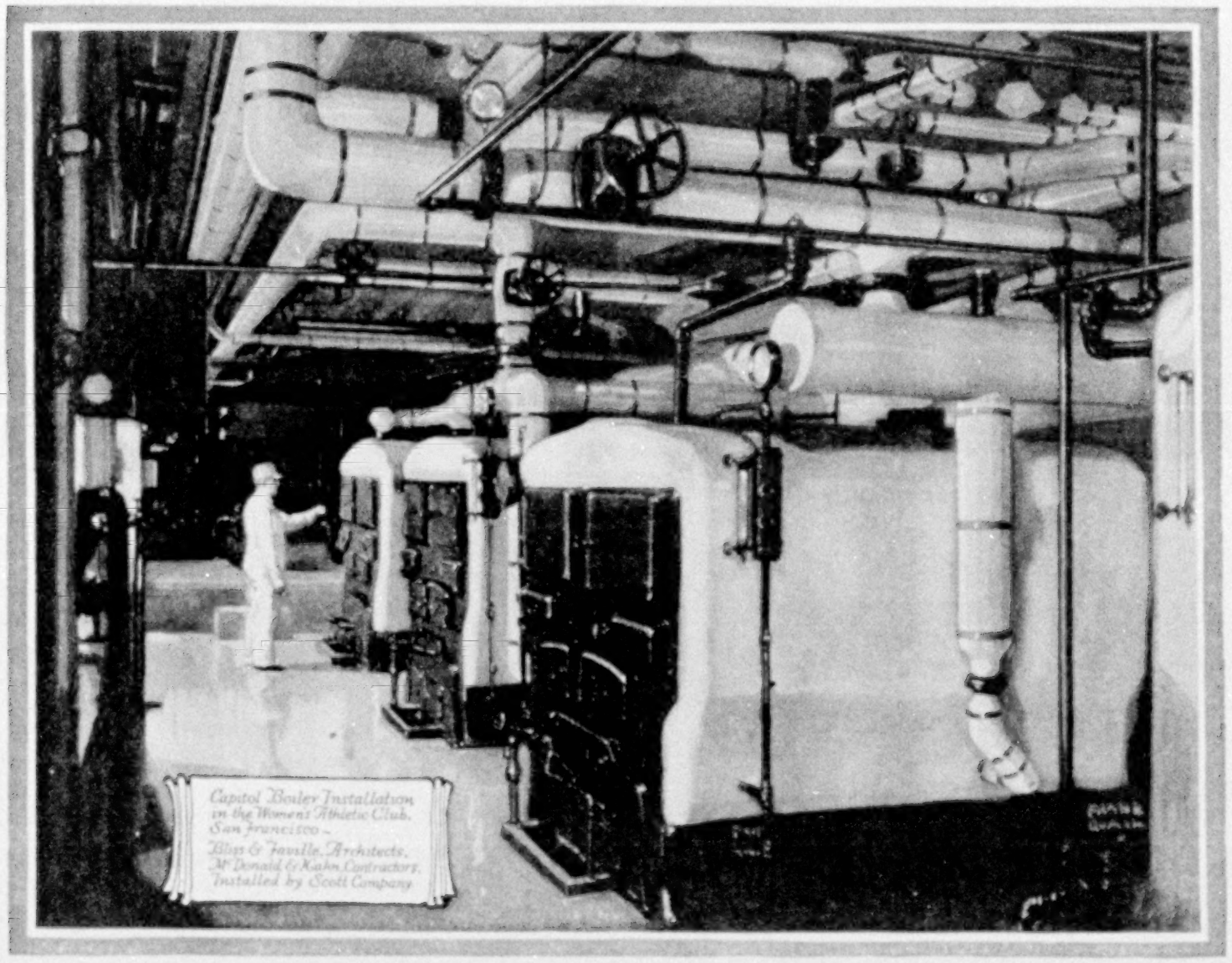
You can't buy better—why pay more?

CENTURY gives you the world's best *music*, beautifully *printed* on the best *paper!* What more can sheet music be? There are over 2300 compositions in the Century catalog all 15c—(20c in Canada), masterpieces like "Hungarian Rhapsody," "Ave Maria," "Alpine Hut," "Cradle Song," "Doll's Dream," etc.—all certified to be exactly as the masters wrote them. Ask for Century—Patronize the Century dealer. Century's low price is only possible because of his small profit. Complete catalog of over 2300 compositions free on request.

Thousands of successful teachers use and recommend CENTURY CERTIFIED MUSIC exclusively—because they know it is all that good music can be at half the price or less; and they know parents appreciate the saving.

Century Music Publishing Company, 211 W. 40th Street, New York City

CENTURY Certified EDITION SHEET MUSIC



Capitol Boiler installations represent the finest expression of modern heating science. They are products of more than thirty years of sustained research work and a rigid standard of quality manufacturing.

Wherever you may find them—in small homes or large public buildings—Capitols perform with utmost economy and live up to every tradition of an honorable name.

In planning your new home you should, by all means, select a heating system of established reputation. If you place your faith in Capitol Boilers and United States Radiators there can be no question as to ultimate satisfaction.

Any heating contractor, architect or heating engineer will gladly confirm these statements. These specialists know the real worth of the Capitol name plate.

UNITED STATES RADIATOR CORPORATION

General Offices, Detroit, Michigan

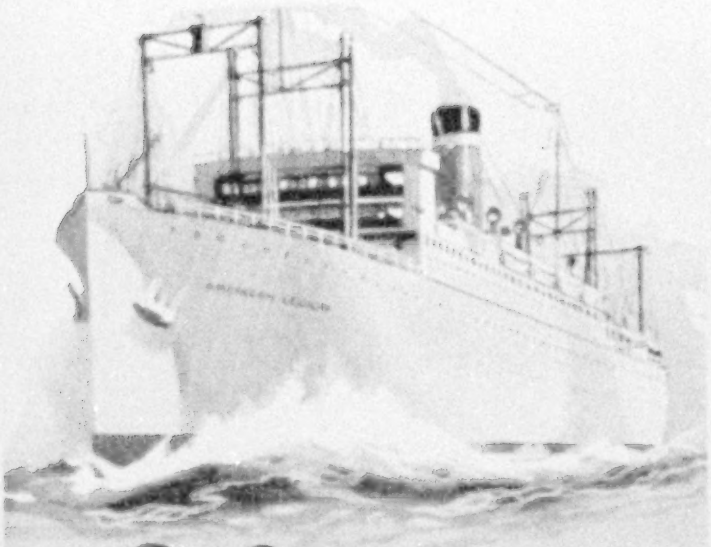
Branch and Sales Offices

*Boston	*Harrison, N. J.	*Cleveland	*Milwaukee	*Kansas City
*Springfield, Mass.	*Philadelphia	*Columbus	*Indianapolis	*Des Moines
*Portland, Me.	*Baltimore	*Cincinnati	*Louisville	*Omaha
*Providence, R. I.	Buffalo	*Detroit	*St. Paul	*Denver
New York	Pittsburgh	*Chicago	*St. Louis	*Seattle
*Brooklyn				*Portland, Ore.

*Warehouse stocks carried at points indicated by star

Capitol Boilers

XUM



Why not South America?

A RARE travel experience—undreamed of scenic wonders—brilliant, magnificent cities—gaiety and color everywhere—a thousand little differences of custom. Plan your trip for this Autumn when it will be Spring below the equator. Remember that *there* the seasons are reversed. Fortnightly sailings from New York by the four white sister ships—fastest and finest to the ports of Rio de Janeiro, Santos, Montevideo and Buenos Aires.

Send the Coupon

for illustrated literature, giving travel facts about South America and the Pan America Line.

Pan America Line

Munson S. S. Line

67 Wall Street **New York City**

Managing Operators for

U. S. SHIPPING BOARD

INFORMATION BLANK
U. S. SHIPPING BOARD
Inform. Desk 1556 Washington, D. C.

Please send the U. S. Government Booklet giving facts about South America and the Pan America Line.

If I go date will be about _____

There will be _____ persons in my party.

Name _____

Address _____

Town _____ State _____

How Good The Bristles Feel!

The first thing you notice about a WHITING-ADAMS BRUSH is *how good the bristles feel.* How strong and springy they are! Then you notice what a clean-cut, perfectly-balanced, and "usable" article the whole brush is. Ask your dealer to show you one.

WHITING-ADAMS BRUSHES

Send for Illustrated Literature

Making a Brush to Last a Lifetime is a Lifetime Job

JOHN L. WHITING-J. J. ADAMS CO.
Boston, U. S. A.
Brush Manufacturers for Over 116 Years and the Largest in the World

Salt Mackerel

CODFISH, FRESH LOBSTER

FOR THE CONSUMER NOT THE DEALER

FOR YOUR OWN TABLE

FAMILIES who are fond of FISH ought to get them DIRECT from GLOUCESTER, as no inland dealer anywhere else can possibly be in a position to offer you goods as perfect and wholesome as we can.

We sell ONLY to the CONSUMER DIRECT, not through grocers or markets. We want to supply YOU, no matter how small your requirements.

We have done a mail-order fish business for thirty years, sending the goods RIGHT TO OUR CUSTOMERS' HOMES, EXPRESS PREPAID EAST OF KANSAS, and guaranteeing complete satisfaction or money refunded.

If you are interested in good fish, won't you drop us a postal that we may send you further information?

Our SALT MACKEREL are tender, juicy fellows—broiled for breakfast they are delicious. SALT CODFISH selected and prepared by our method is unexcelled.

Much of the fresh fish you buy in the market is at least several days old. OUR CANNED FISH, being STEAM STERILIZED, is ABSOLUTELY FRESH.

Our FRESH LOBSTERS, in parchment-lined cans, go through no process except boiling (no preparation of any kind being used). Opened and packed solid in whole pieces as soon as taken from the water, they retain their crispness and natural flavor. CRABMEAT, SHRIMP and CLAMS have likewise a perfectly natural appearance and taste.

Our SALMON, TUNNY and IMPORTED FISH DELICACIES are always the best produced.

A selection of our FISH PRODUCTS should always be in your STORE-ROOM for daily use and for the preparation at a moment's notice of dozens of dainty or substantial dishes.

Send for Descriptive Price List

Frank E. Davis Co., 59 Central Wf., Gloucester, Mass.

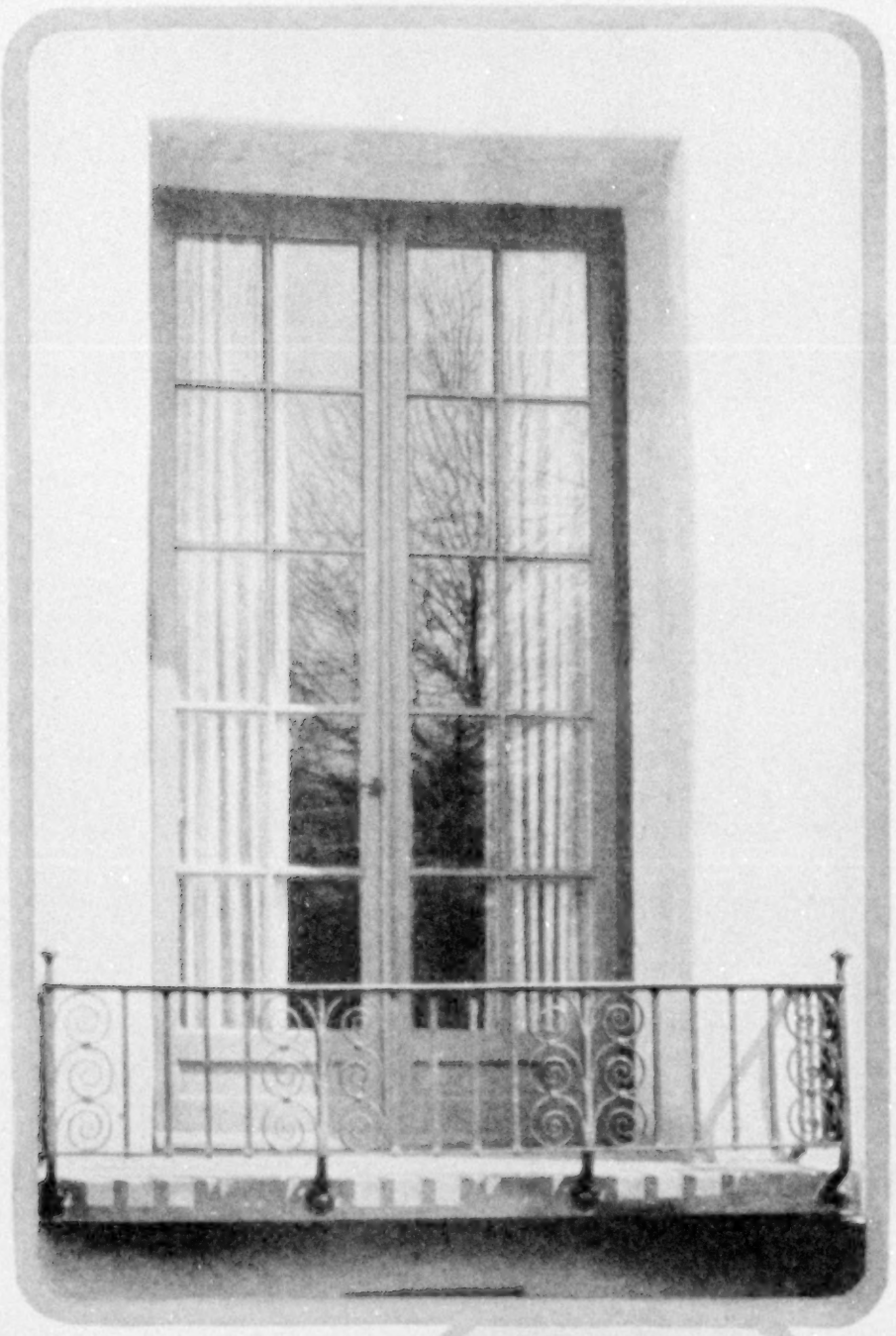
THE PLATE GLASS IN THIS HOUSE COST ONLY $325

PLATE GLASS was used in every exterior window and door of this attractive residence at a cost of only $325. As the cost of the house was $60,000, the cost of the Plate Glass was only half of one per cent of the total! In most houses the cost will not run over one per cent.

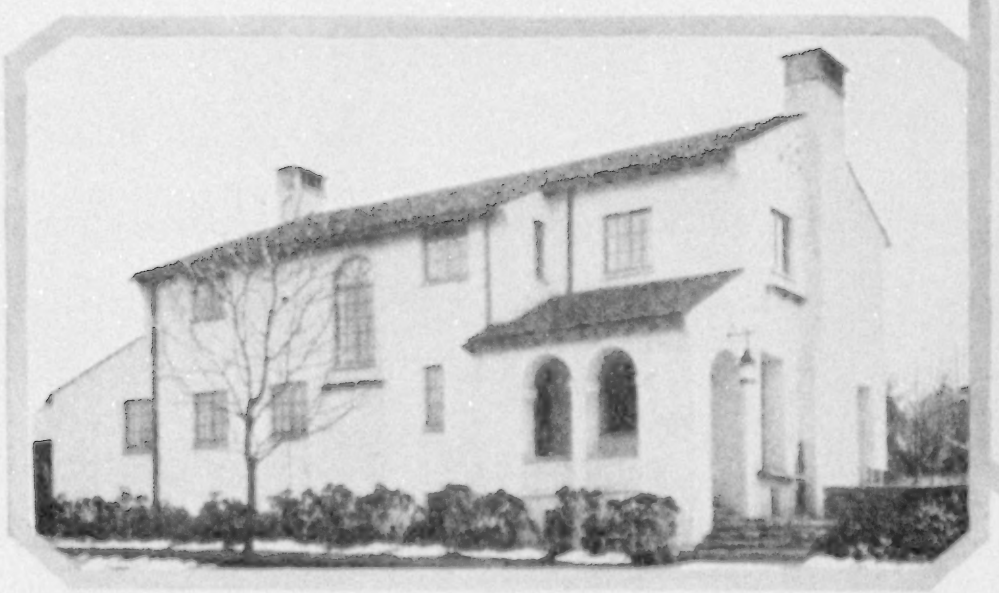
Glazing is a small item in any list of specifications. It is certainly worth the slight additional cost to specify Plate Glass, as Plate Glass adds an element of beauty that cannot be approached in any other glass. It returns far more than its actual cost in the increased selling or renting value of the house. Its value is returned many times, too, in the satisfaction it gives the owner.

Your architect will gladly furnish comparative estimates.

PLATE GLASS MANUFACTURERS
of AMERICA



House designed by
Wetherill P. Trout, Philadelphia



Use PLATE Glass ©

Nothing Else is Like it ©

A Garden Full of Darwin Tulips for $2.00

In anticipation of again placing before our customers a collection of Darwin Tulips we have had a sufficient quantity grown so that we can offer

50 Giant Darwin Tulip Bulbs, Finest Mixed, for $2.00

selected from fifteen named varieties

Few spring flowering plants rival the Darwin Tulip for brilliance of bloom. Borne on strong stems often exceeding three feet. They are a wonderful addition to the flower garden.

Plant any time before the ground becomes frozen, and they will bloom from the middle of May to Decoration Day

Mail this advertisement, or present at our store, with check, money order, cash or stamps and secure this exceptional collection, sent prepaid to any point in the U. S. east of the Mississippi. For points west and Canada add 25c ($2.25.)

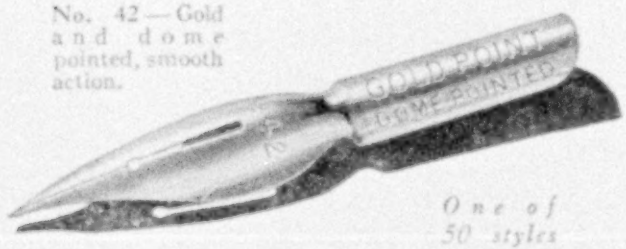
Our 1924 Fall Bulb Catalogue sent on request

Stumpp & Walter Co

30 and 32 Barclay Street — New York

Spencerian *Personal* Steel Pens

No. 42—Gold and dome pointed, smooth action.



One of 50 styles

SPENCERIAN Personal Steel Pens differ from ordinary kinds just as tailored clothes differ from "ready-mades." They are *hand-built* from the finest Spencerian steel. They are perfect in finish, with just the proper flexibility and smoothest possible points. One of the fifty different styles and sizes was built especially for your handwriting! It will prove a revelation in writing-ease. It is worth any two ordinary pens. It costs no more.

Send 10c for 10 sample pens and free booklet, "What your handwriting reveals."

SPENCERIAN PEN CO.
349 Broadway — New York

Save the trouble of Coffee Making—
Use Washington's Delicious Instant Coffee
it is made

Just add water—dissolve and drink

Send 10c for Special Trial Size—Recipe Booklet Free

G. WASHINGTON COFFEE REFINING CO. - 522 Fifth Avenue, New York

THIS MAGAZINE IS FROM OUR PRESSES

JUDD & DETWEILER, INC.
Master Printers

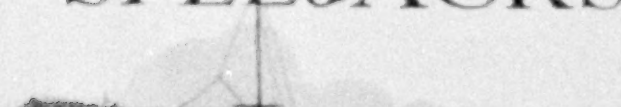
ECKINGTON PLACE AND FLORIDA AVENUE — WASHINGTON, D. C.

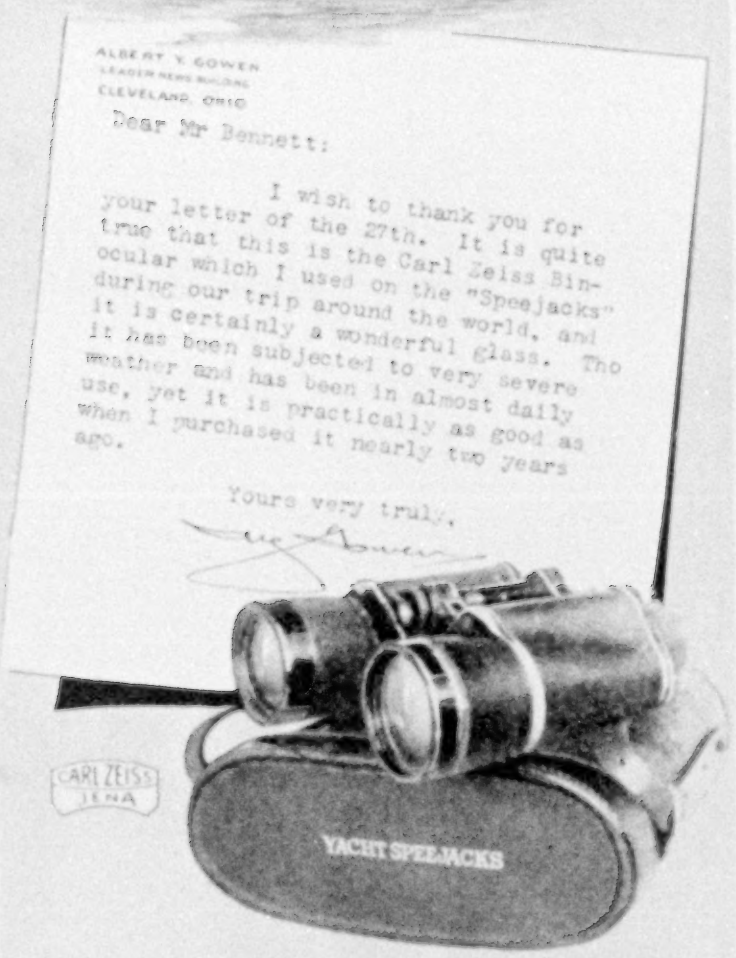
Whatever Your Question;—be it the pronunciation of Fascista, the spelling of a puzzling word, the location of Esthonia the meaning of soviet, realtor, vitamin, etc., this Supreme Authority—

WEBSTER'S NEW INTERNATIONAL DICTIONARY

contains an accurate, final answer. 407,000 Words 2700 Pages 6000 Illustrations.
Regular and India-Paper Editions
G. & C. MERRIAM CO., Springfield, Mass.
"The Magic of Words" and Pocket Maps FREE if you mention The Geographic

Around the world with the "SPEEJACKS"





CARL ZEISS

Wide-angle Prism Binoculars

Another striking endorsement of Carl Zeiss Prism Binoculars.

The glass used on the Speejacks is the same model used by Capt. Hartley of the S. S. Leviathan—he says "Carl Zeiss glasses are the last word in binoculars, for power, feel, weight and ease on the eyes."

Ask your dealer to show you the new *wide-angle* binoculars. Write us for catalog.

HAROLD M. BENNETT, U. S. Agt, 155 W. 23d St., New York
Gen'l Distributing Agts. for Canada: The Hughes Owens Co., Ltd.
Montreal Toronto Winnipeg Ottawa

Across the Pacific via Honolulu

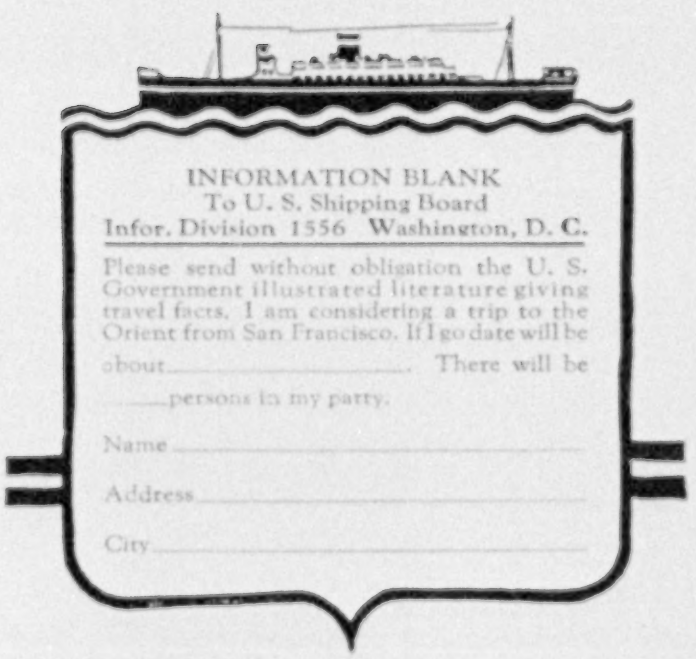
GOING to the Orient? Longing for the release and freedom of traveling in strange lands? Then send the information blank today. Learn about the U. S. Government ships operated by the Pacific Mail Steamship Company over the Sunshine Belt to the Orient via Honolulu. One of five sister ships sails from San Francisco every 14 days to Yokohama, Kobe, Shanghai, Hong Kong and Manila. Stop-over privileges at all ports.

Make your plans now to take this trip to the wonder lands across the Pacific.

Pacific Mail Steamship Co.

10 Hanover Square - - - - New York City
508 California Street - - San Francisco, Cal.
503 So. Spring Street - - - Los Angeles, Cal.
or your local Agent

Managing Operators for
UNITED STATES SHIPPING BOARD



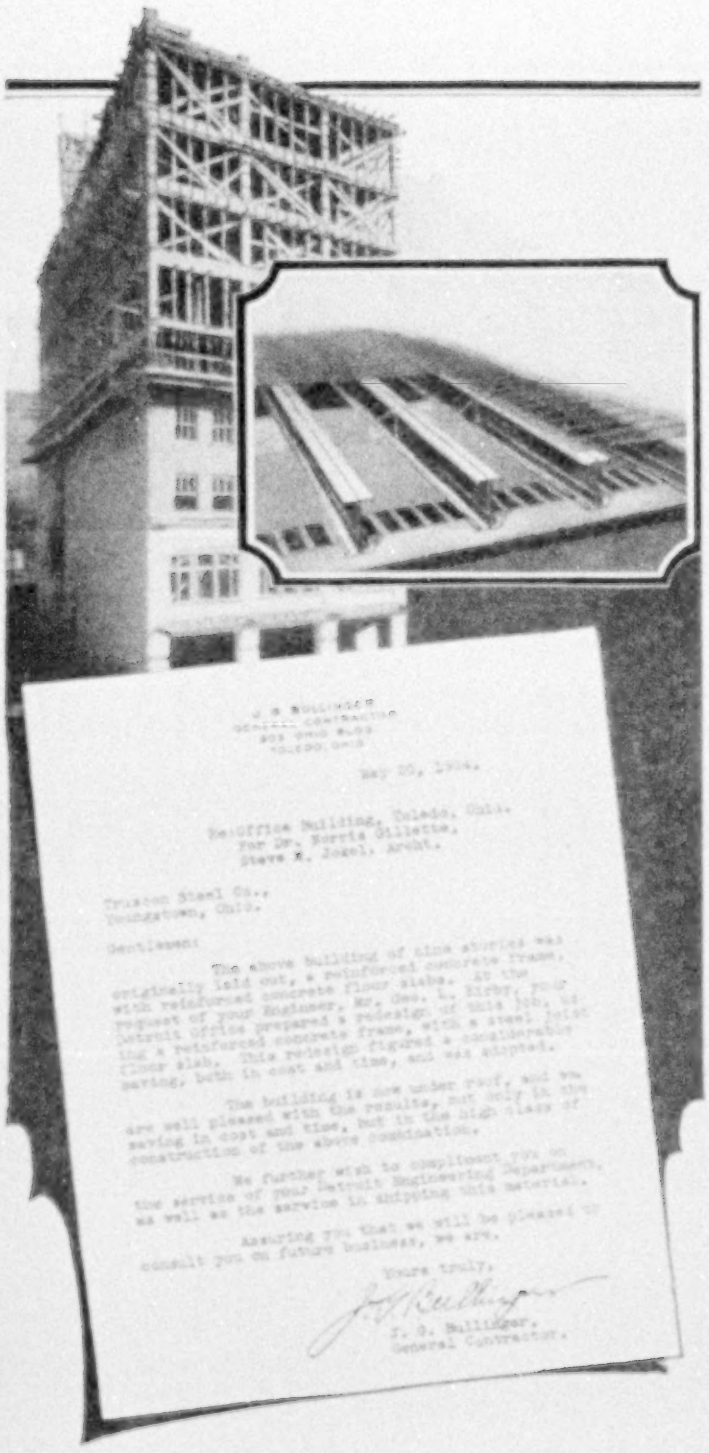
INFORMATION BLANK
To U. S. Shipping Board
Infor. Division 1556 Washington, D. C.

Please send without obligation the U. S. Government illustrated literature giving travel facts. I am considering a trip to the Orient from San Francisco. If I go date will be about_____. There will be _____ persons in my party.

Name _____

Address _____

City _____



J. G. BULLINGER
GENERAL CONTRACTOR
303 OHIO BLDG
TOLEDO, OHIO

May 20, 1904.

Re: Office Building, Toledo, Ohio.
For Dr. Norris Gillette,
Steve E. Jokel, Archt.

Truscon Steel Co.,
Youngstown, Ohio.

Gentlemen:

The above building of nine stories was originally laid out, a reinforced concrete frame, with reinforced concrete floor slabs. At the request of your Engineer, Mr. Geo. L. Kirby, your Detroit Office prepared a redesign of this job, using a reinforced concrete frame, with a steel joist floor slab. This redesign figured a considerable saving, both in cost and time, and was adopted.

The building is now under roof, and we are well pleased with the results, not only in the saving in cost and time, but in the high class of construction of the above combination.

We further wish to compliment you on the service of your Detroit Engineering Department, as well as the service in shipping this material.

Assuring you that we will be pleased to consult you on future business, we are,

Yours truly,

J. G. Bullinger

J. G. Bullinger,
General Contractor.

Conclusive Evidence

Examples like the above are the reason for the growing popularity of Truscon Steel Joist construction. Its first cost using cement finish floor is less than wood construction with hardwood floors. Its advantages over other types of fireproof construction are its lower cost, simplicity, dependability and quick erection.

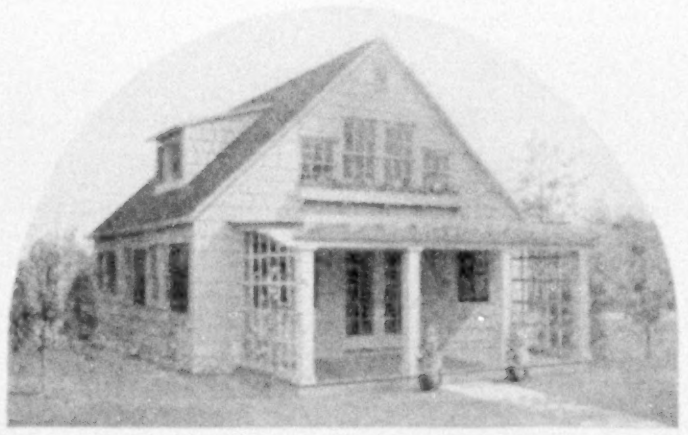
For any light-occupancy building, large or small—apartment, hotel, office, store, school or hospital—use Truscon Steel Joists.

Write for catalog, suggestions, and estimates.

Truscon Steel Co., Youngstown, Ohio

Warehouses and Sales Offices from Pacific to Atlantic
For addresses see phone books of principal cities
Canada: Walkerville, Ontario. Foreign Div.: New York

TRUSCON
STEEL JOISTS



Save Hundreds of Dollars When You Build

You can own your own home for an astonishingly low figure when you build the Bossert way. 25% of the usual cost of erecting is entirely eliminated by the Bossert "Ready-Cut" Method.

You get all necessary plans and specifications, lumber, mill-work, plasterboard, hardware, paint and varnish. The very home you have always wanted is yours at minimum cost.

Send 20c today for catalog showing the many beautiful homes you can get from Bossert.

LOUIS BOSSERT & SONS, Inc.
1313 Grand St. Brooklyn, N. Y.

it works easily

WATCH how swiftly and thoroughly Sani-Flush works. Simply sprinkle a little into the toilet bowl, follow directions on the can, and flush. All stains and incrustations disappear.

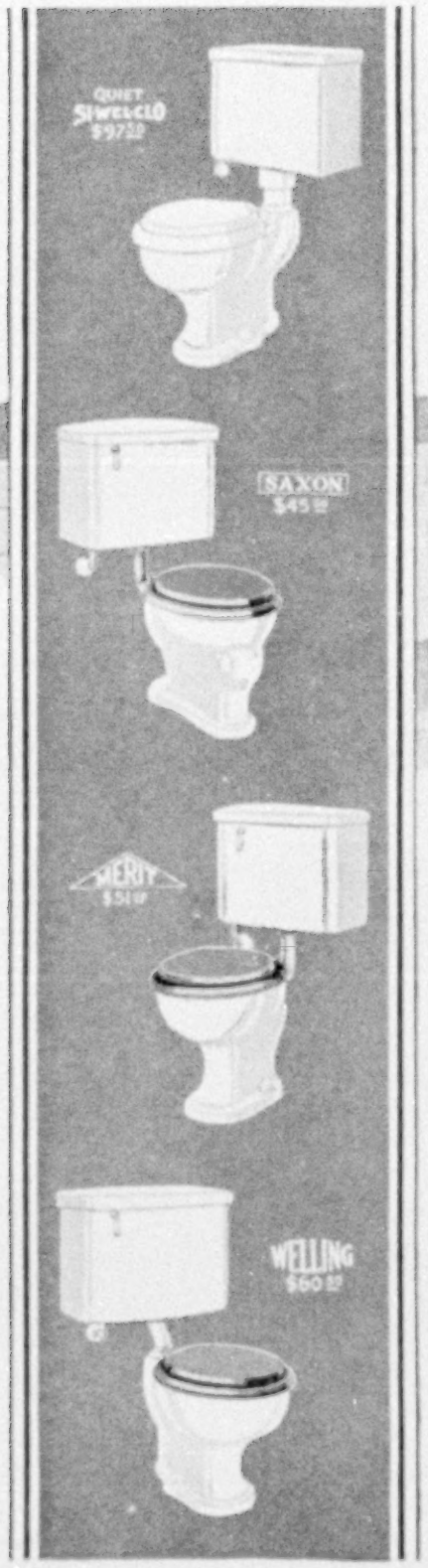
The hidden, unhealthful trap is also cleaned and made sanitary. Sani-Flush will not injure plumbing connections.

Sani-Flush destroys all foul odors. Always keep a can handy in the bathroom.

Buy Sani-Flush at your grocery, drug or hardware store, or send 25c for a full-size can.

THE HYGIENIC PRODUCTS CO.
Canton, Ohio

Sani-Flush
Reg. U.S. Pat. Off.
Cleans Closet Bowls Without Scouring



IT is in the bathroom that your little children first learn the rudiments of health and hygiene. The influence of the "health-center" on your children's habits of personal cleanliness is in direct proportion to the care with which you have chosen the fixtures.

Proper sanitation demands a water closet that flushes thoroughly, quickly, and is of such material as can be most easily cleaned. "Tepeco" supplies such fixtures at a price range within the reach of all.

Write for our free Plan Book
"Bathrooms of Character" S-4

The Trenton Potteries Company
Trenton, N. J., U. S. A.

New York Boston San Francisco

TEPECO Water Closets
FOR EVERY PLACE AND PURSE

Easy to Hang Pictures and to Hide the Ugly Wires

Mounted and unmounted pictures, and even small framed ones, are easily displayed with

Moore Push-Pins

Glass Heads—Steel Points

For larger pictures, mirrors, clocks, or any heavier wall decorations, use

Moore Push-less Hangers

"The Hanger with the Twist"

The fine tool-tempered steel points will not injure the finest woodwork or wall paper.

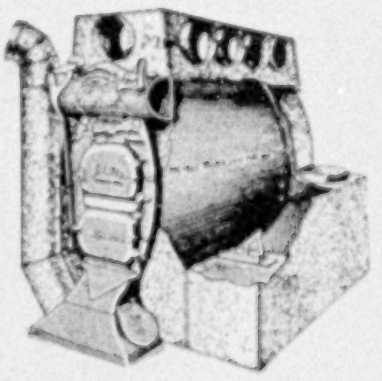
10c. Pkts. Everywhere

Moore Push-Pin Co., Philadelphia, Pa.

Needs Firing Only Once-a-Day

Fuel economy to a surprising degree is combined with unusual simplicity of operation because of the scientific design and construction of

THE FARQUHAR HEATING AND VENTILATING SYSTEM



Once-a-day firing, plus a warmth that is pure, fresh, and invigorating, comes as a result of these exclusive features:

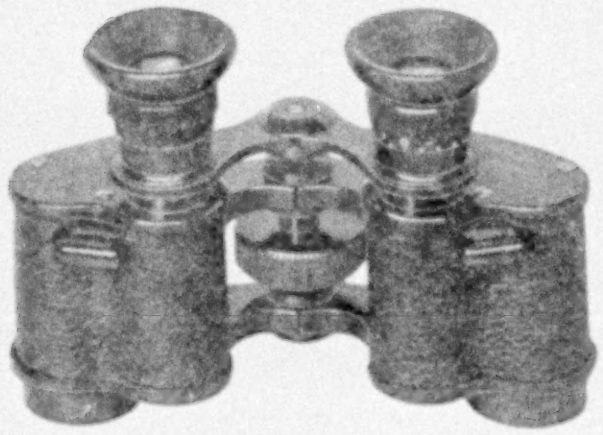
One-piece firebox
Large grate area
Automatic control
Vent and Return System

Write for free booklet.

The Farquhar Furnace Co.
Dept. 909 Wilmington, Ohio

Military Binoculars

French and German



8 POWER **$19.50** POSTPAID

Case and carrying straps included

FINE Military Prismatic Binoculars. All new or practically new. Many of these binoculars were received direct from the ALLIED REPARATIONS' COMMISSION. All are guaranteed perfect.

Glasses of this type usually sell at $40.00 to $50.00. These glasses are of the wide angle type day and night lenses with pupillary adjustment.

All are prismatic with achromatic objective lenses. Manufactured by makers of the world's finest binoculars.

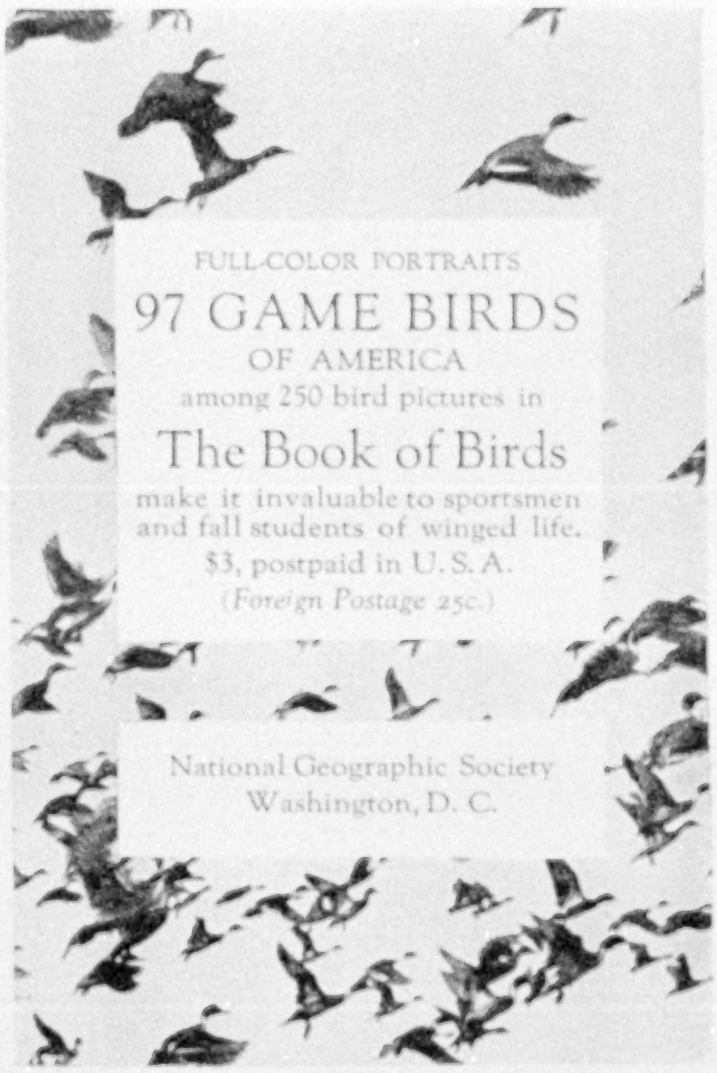
Glasses will be shipped promptly on receipt of check or money order covering purchase price under positive guarantee of full cash refund on any glasses returned

ORDER YOUR MILITARY BINOCULARS TODAY

HENDERSON BROTHERS

IMPORTERS

97 Federal Street Boston, Mass.



Mr. Executive:

Does your advertising department know it ?

You have doubtless taken minutes from a busy day to tell friends of the deep personal enjoyment and the satisfaction you and your entire family gain from THE GEOGRAPHIC MAGAZINE.

Very likely, too, you are one of the many, many thousands who write: "The only magazine I keep—invaluable for re-reading and reference." *But does your advertising department know this?*

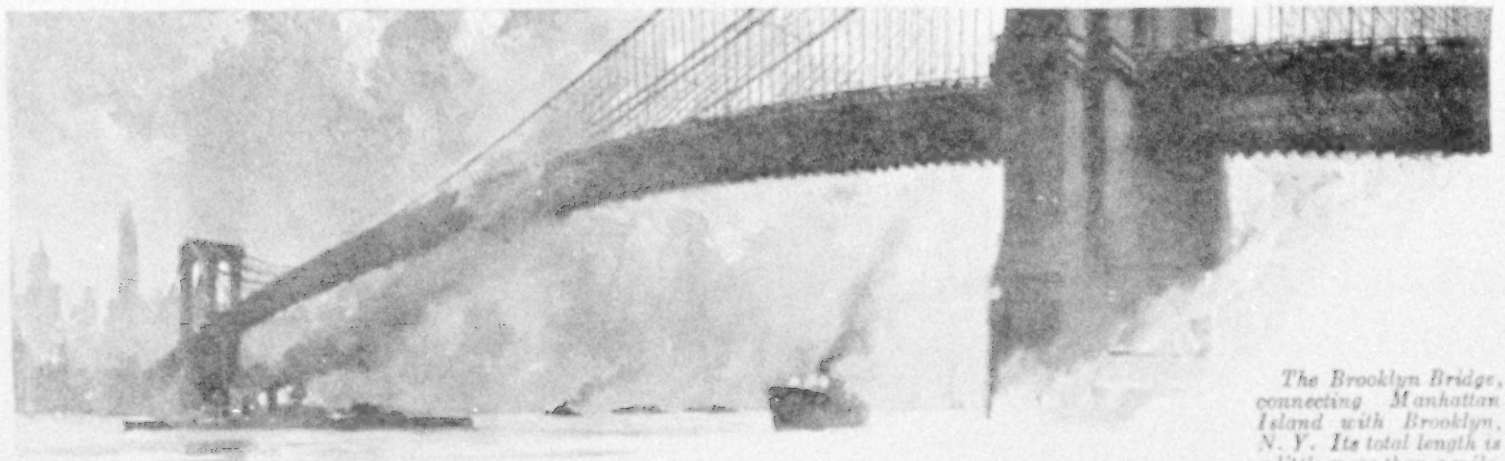
Have you or they realized that the men, women, and children in 950,000 other homes, also above average in intelligence and income, react in the same discriminating way to "Our Magazine, THE GEOGRAPHIC"—that among them is a surprising percentage of executives like yourself?

You must have realized that many of the Nation's shrewdest advertisers would not continue to use THE GEOGRAPHIC *increasingly* year after year unless it produced results.

Can you, your advertising department, your agency, afford to know less than these analytical advertisers have proved to their great profit—that is, if you, too, make better products or sell better service?

ONLY advertising of the highest integrity is solicited or admitted to these pages and the purchasing agents in 950,000 homes know it and respond to an amazing degree. Have your secretary write today for proof.

WASHINGTON, D. C. THE NATIONAL GEOGRAPHIC MAGAZINE



The Brooklyn Bridge, connecting Manhattan Island with Brooklyn, N. Y. Its total length is a little more than a mile.

Where lead is a shield for steel

STREAKS of red stand out against the sky. Tiny figures suspended in mid-air cover the cables of the bridge with red-lead.

Lead is the shield that protects the steel cables, girders, and beams from rust and prevents the bridge from becoming a death-trap.

This is only one of the many ways in which lead constantly serves you and guards your safety. As red-lead in paint you see it on metal surfaces everywhere. Red-lead is the standard protection for iron and steel.

Nearly twenty million pounds of red-lead are applied to metal every year in this country. Yet this is not enough. Rust still destroys millions of tons of steel. Between 1860 and 1920 the world's output of iron and steel was about 1,860,000,000 tons. Of this total it was estimated that 660,000,000 tons rusted in use.

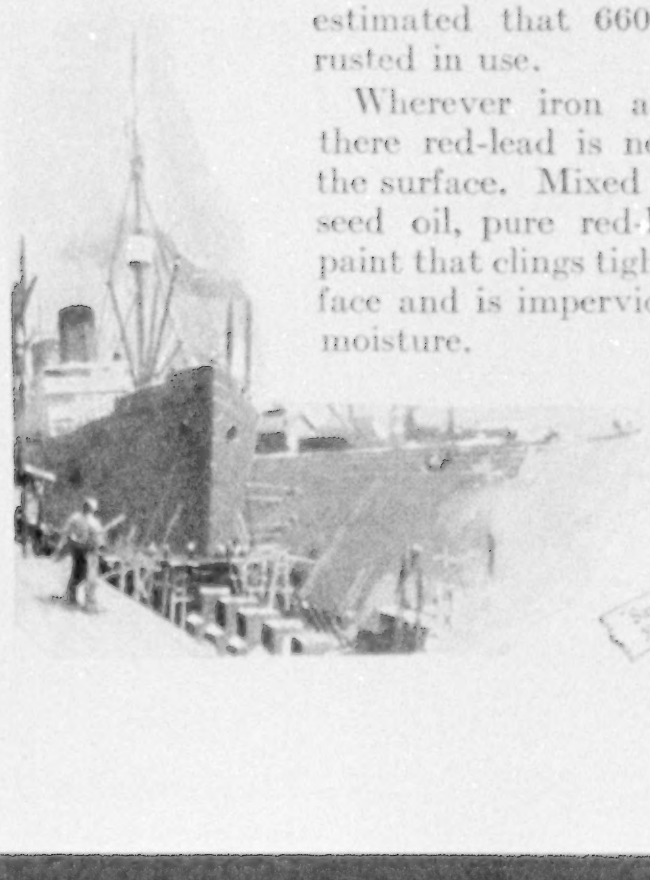
Wherever iron and steel are, there red-lead is needed to save the surface. Mixed with pure linseed oil, pure red-lead makes a paint that clings tightly to the surface and is impervious to air and moisture.

Dutch Boy red-lead is the name of the pure red-lead made and sold by National Lead Company. On every keg is the picture of the Dutch Boy Painter. This well-known trade mark guarantees a product of the highest quality.

Dutch Boy products also include white-lead, linseed oil, flatting oil, babbitt metals and solder.

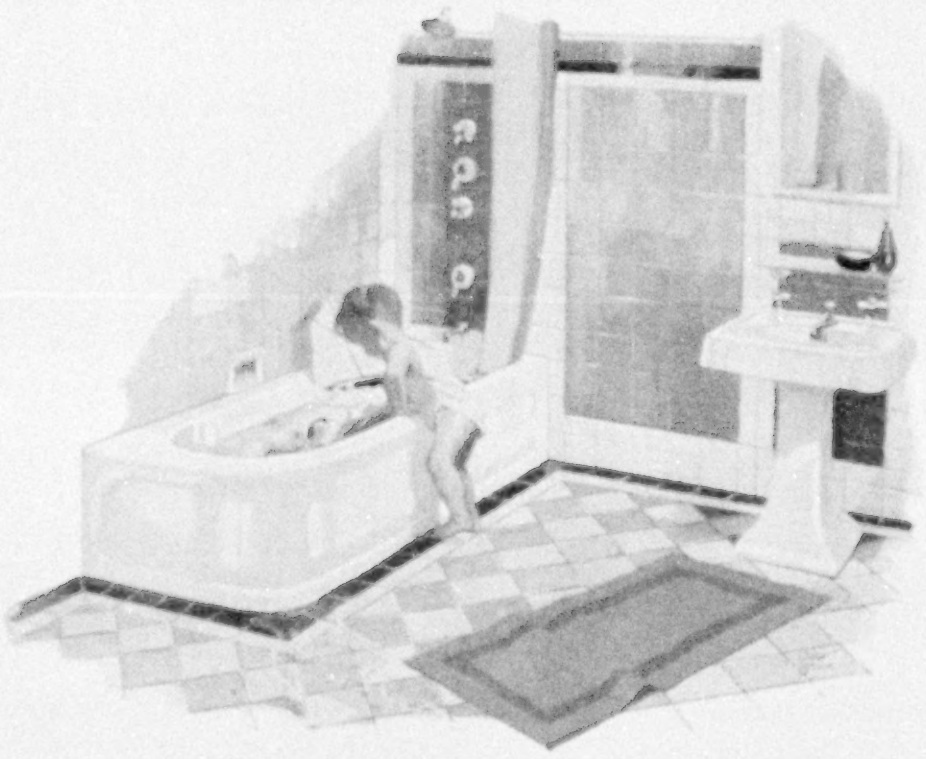
We have a special booklet, "Protection of Structural Metal," which we shall gladly send to anyone who is interested. This booklet contains information telling when and how to give red-lead paint protection to structural iron and steel.

If you desire to read more about the use of lead, we can recommend a number of interesting books. The latest and probably the most complete story of lead and its many uses is "Lead, the Precious Metal," published by the Century Co., New York. Price $3.00. If you are unable to get it at your bookstore, write the publishers direct, or we shall be glad to place the order for you.



NATIONAL LEAD COMPANY

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 485 California St.; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut St.



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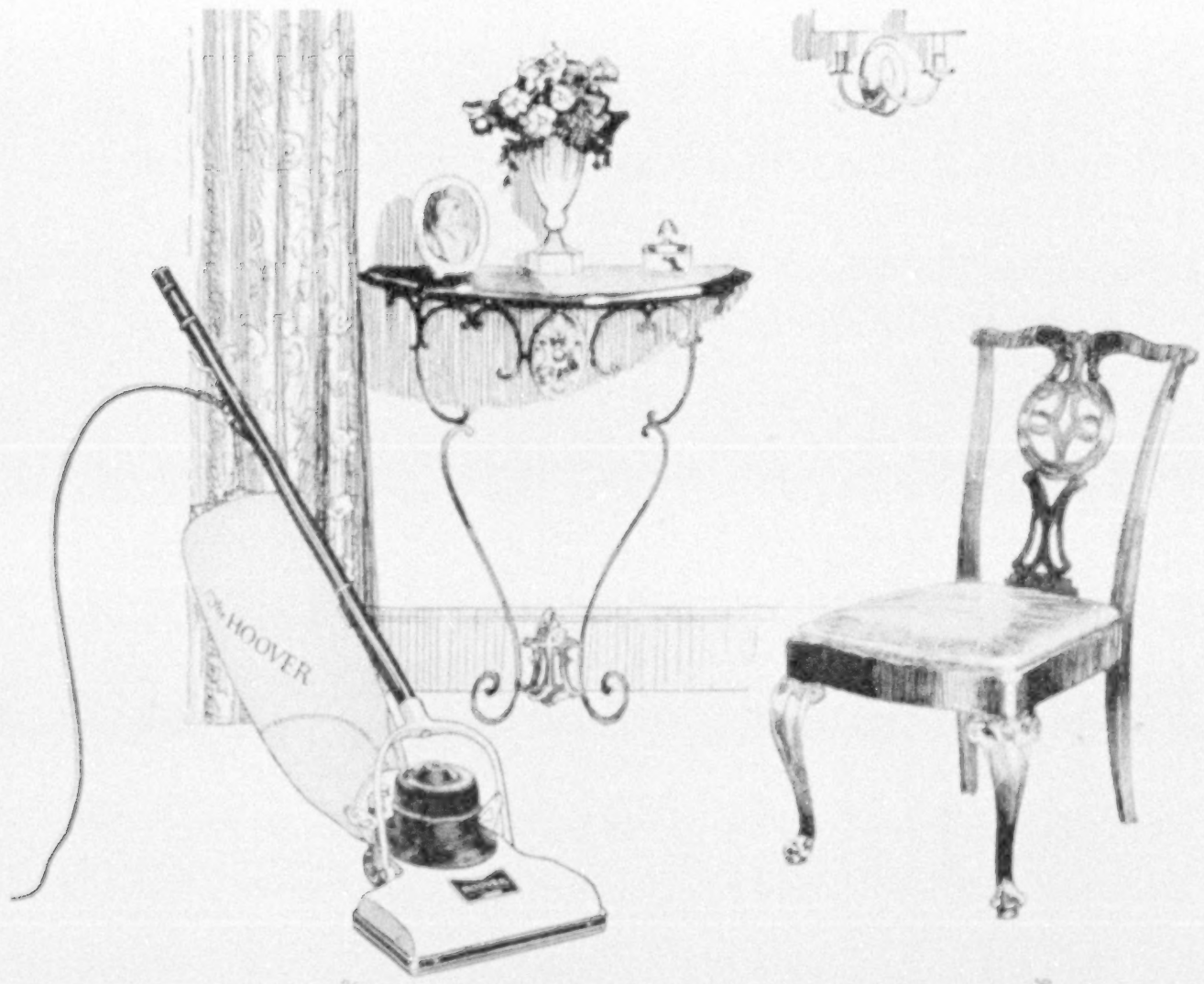
Other Kohler fixtures for bathrooms, kitchens, and laundries offer the same unusual combination of moderate cost and the finest quality that can be made.

Look for the mark of that quality the next time you look at plumbing fixtures—the name "Kohler" unobtrusively fused into the durable, snowy enamel for which Kohler Ware has been famous for nearly half a century . . . . May we send you an interesting booklet about this ware?

KOHLER OF KOHLER

Kohler Co., *Founded 1873*, Kohler, Wis. *Shipping Point*, Sheboygan, Wis.
BRANCHES IN PRINCIPAL CITIES

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.



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MELBA
Victor Artist

"Heavens, it's me!" was Melba's first comment on her first Victor Record. From that day to this she has never varied in her opinion. That Victor recording should have scored so great a triumph in so diversified a repertoire will be the more readily understood by listening to the following:

	Double-faced	
Rigoletto—Caro nome Traviata—Ah, fors' è lui	6213	$2.00
Faust—Air des bijoux Hamlet—Scène et Air d'Ophélie	6215	2.00
Good-Bye Oh, Lovely Night	6222	2.00

© Underwood & Underwood

SCHIPA
Victor Artist

Schipa's Victor Records testify that here is a tenor who sings with ease of production, with lyric smoothness, yet with wholesome manliness, everything he does. A singer of original mind choosing to sing only what suits his voice and method, he is an excellent judge, as a hearing of the following of his records will show:

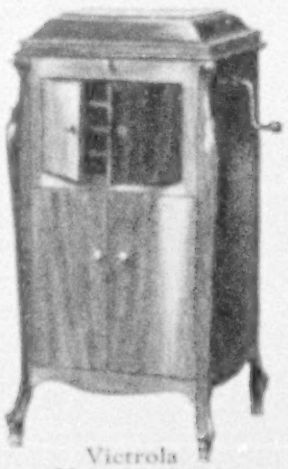
	Double-faced	
Granadinas Princesita	827	$1.50
Pagliacci—Serenata d'arlecchino Manon—Il Sogno	828	1.50
Barbiere di Siviglia— Ecco ridente in cielo Barbiere di Siviglia—Se il mio nome	965	1.50

© Townsend

WERRENRATH
Victor Artist

Werrenrath's baritone, clear, smooth and sympathetic is at its best today. He began early making records for the Victor Company and gained instant favor with the large Victor public. By sheer merit, he has won a place among the greatest in the Red Seal section, and that this was inevitable is amply indicated in the following:

	Double-faced	
Dreaming Alone in the Twilight Love Sends a Little Gift of Roses	843	$1.50
Story of the Rose Tell Me Daisy	846	1.50
Danny Deever On the Road to Mandalay	6360	2.00



Victrola
No. 100, $150
Mahogany, oak or walnut

Victrola No. 210
$110
Mahogany, oak or walnut

Victrola No. 405
Walnut, $250; electric, $290

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